JAPANESE [JP,09-091129,A]

CLAIMS DETAILED DESCRIPTION TECHNICAL FIELD PRIOR ART EFFECT OF THE INVENTION TECHNICAL PROBLEM MEANS DESCRIPTION OF DRAWINGS DRAWINGS

[Translation done.]

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CLAIMS

[Claim(s)]
[Claim 1] It is the image processing system characterized by to be the image processing system held for a storage means to by_which a control program is rewritable, to have the control means which controls the whole equipment according to said control program, and the rewriting means which rewrite said control program, and for said control means to direct processing in_which it can operate in the case of rewriting by said rewriting means, and to permit actuation of this processing in the case of rewriting by said rewriting means.
[Claim 2] Said storage means is an image processing system according to claim 1 characterized by including a flash ROM.
[Claim 3] Said storage means is an image processing system according to claim 2 characterized by including EEPROM.
[Claim 4] Processing in which it can operate in the case of rewriting by said rewriting means is an image processing system according to claim 1 characterized by said control program being the processing which does not involve directly.
[Claim 5] Furthermore, the storage means in which said rewriting is possible is an image processing system according to claim 4 characterized by processing in which it has the 2nd control program for the 2nd different storage means, and can operate in the case of rewriting by said rewriting means being processing by said 2nd control program.
[Claim 6] Said 2nd storage means is an image processing system according to claim 5 characterized by the ability not to rewrite.
[Claim 7] Furthermore, it is the image processing system according to claim 1 characterized by reporting the purport which is under rewriting in the case of rewriting have an information means to report a device status to an operator, and according [said information means] to said rewriting means.
[Claim 8] Said information means is an image processing system according to claim 7 characterized by reporting processing in which it can operate in the case of rewriting by said rewriting means.
[Claim 9] The control means which is the image processing system held for a storage means by which a control program is rewritable, and controls the whole equipment according to said control program, Have the rewriting means which rewrites said control program, and said storage means divides and holds said control program to two or more modules. Said rewriting means rewrites in said module unit. Said control means The image processing system characterized by directing processing in which it can operate in the case of rewriting by said rewriting means, from said two or more modules, and permitting actuation of this module in the case of rewriting by said rewriting means.
[Claim 10] Said control means is an image processing system according to claim 9 characterized by interrupting said rewriting when said directed module operates in the case of rewriting by said rewriting means.
[Claim 11] Said storage means is an image processing system according to claim 9 characterized by including a flash ROM.
[Claim 12] Said storage means is an image processing system according to claim 11

characterized by including EEPROM.
[Claim 13] Furthermore, it is the image processing system according to claim 9 characterized by reporting the purport which is under rewriting in the case of rewriting have an information means to report a device status to an operator, and according [said information means] to said rewriting means.
[Claim 14] Said information means is an image processing system according to claim 13 characterized by reporting processing in which it can operate in the case of rewriting by said rewriting means.
[Claim 15] The image-processing approach characterized by being the image-processing approach in the image processing system held for a storage means by which a control program is rewritable, directing processing in which it can operate in case said control program is rewritten, and permitting actuation of this processing in the case of rewriting.
[Claim 16] It is the image-processing approach characterized by being the image-processing approach in the image processing system held for a storage means by which a control program is rewritable, for said storage means dividing and holding said control program to two or more modules, directing processing in which it can operate in case said control program is rewritten in said module unit, from said two or more modules, and permitting actuation of this module in the case of rewriting.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the image processing system which rewrites the control program provided in an image processing system, and its approach, concerning an image processing system and its approach.
[0002]
[Description of the Prior Art] PROM (programmable ROM) which can write in a program, and EPROM (erasable PROM) of an ultraviolet-rays elimination mold were used the mask ROM which wrote in fixed data (control program) in the production process from before as nonvolatile memory which stores the control program in an image processing system, and after manufacture. In recent years, EEPROM (electrically erasable and programmable ROM) which is rewritable nonvolatile memory electrically is developed as memory replaced with these, and using these also in an image processing system is proposed. By using the nonvolatile memory in which such rewriting is possible, it became possible easily for it to become unnecessary to perform ROM exchange in the case of correction of a control program and modification, and to rewrite this program on an onboard. Thereby, when it was the image processing system connected through the network, the control program could also be rewritten using the communication link from the remote place.
[0003]
[Problem(s) to be Solved by the Invention] However, in the image processing system which stored the control program in the rewritable nonvolatile memory mentioned above, when this control program was rewritten, this image processing system needed to stop the whole of the function. That is, since other processings were not able to be performed during rewriting actuation of memory, there was a problem that processing effectiveness will fall.
[0004] It is made in order that this invention may solve the technical problem mentioned above, and it aims at offering the image processing system which can perform a certain image processing, and its approach during rewriting actuation of a control program.
[0005]
[Means for Solving the Problem] The image processing system of this invention is equipped with the following configurations as a way stage for attaining the purpose mentioned above.
[0006] That is, it is the image processing system which held for a storage means to by_which a control program is rewritable, and it has the control means which controls the whole equipment according to said control program, and the rewriting means which rewrites said control program, said control means directs processing in_which it can operate in the case of rewriting by said rewriting means, and it is characterized by to permit actuation of this processing in the case of rewriting by said rewriting means.
[0007] For example, it is characterized by said storage means containing a flash ROM.
[0008] For example, it is characterized by said storage means containing EEPROM.
[0009] For example, processing in which it can operate in the case of rewriting by said rewriting means is characterized by said control program being the processing which does not involve directly.

[0010] Furthermore, the storage means in which said rewriting is possible is characterized by processing in which it has the 2nd control program for the 2nd different storage means, and can operate in the case of rewriting by said rewriting means being processing by said 2nd control program.
[0011] For example, said 2nd storage means is characterized by the ability not to rewrite.
[0012] Furthermore, it has an information means to report a device status to an operator, and said information means is characterized by reporting the purport which is under rewriting in the case of rewriting by said rewriting means.
[0013] For example, said information means is characterized by reporting processing in which it can operate in the case of rewriting by said rewriting means.
[0014] Moreover, the control means which is the image processing system held for a storage means by which a control program is rewritable, and controls the whole equipment according to said control program, Have the rewriting means which rewrites said control program, and said storage means divides and holds said control program to two or more modules. Said rewriting means rewrites in said module unit, said control means directs processing in which it can operate in the case of rewriting by said rewriting means, from said two or more modules, and it is characterized by permitting actuation of this module in the case of rewriting by said rewriting means.
[0015] For example, said control means is characterized by interrupting said rewriting, when said directed module operates in the case of rewriting by said rewriting means.
[0016] For example, it is characterized by said storage means containing a flash ROM.
[0017] For example, it is characterized by said storage means containing EEPROM.
[0018] Furthermore, it has an information means to report a device status to an operator, and said information means is characterized by reporting the purport which is under rewriting in the case of rewriting by said rewriting means.
[0019] For example, said information means is characterized by reporting processing in which it can operate in the case of rewriting by said rewriting means.
[0020] The image-processing approach of this invention is equipped with the following processes as a way method for attaining the purpose mentioned above.
[0021] That is, it is the image-processing approach in the image processing system held for a storage means by which a control program is rewritable, and processing in which it can operate in case said control program is rewritten is directed, and it is characterized by permitting actuation of this processing in the case of rewriting.
[0022] Moreover, it is the image-processing approach in the image processing system held for a storage means by which a control program is rewritable, and said storage means divides and holds said control program to two or more modules, processing in which it can operate in case said control program is rewritten in said module unit is directed from said two or more modules, and it is characterized by permitting actuation of this module in the case of rewriting.
[0023]
[Embodiment of the Invention] Hereafter, 1 operation gestalt concerning this invention is explained to a detail with reference to a drawing.
[0024] <1st operation gestalt> drawing 1 is the block diagram showing the configuration of the image processing system in this operation gestalt. In drawing 1 , 10 is an image processing system, 11 is external devices, such as a host computer, and the predetermined interface connects mutually. Moreover, for 1, as for the printer section and 3, in an image processing system 10, the reader section and 2 are [the facsimile section and 4] hard disks.
[0025] Hereafter, the actuation in the above-mentioned configuration is explained. First, the reader section 1 reads optically the image of the manuscript laid in the non-illustrated manuscript base, and outputs the image data according to a manuscript image to the printer section 2 and the facsimile section 3. In addition, in the image processing system 10 of this operation gestalt, it shall have the memory set as the rewriting object of the program mentioned later in the reader section 1. The printer section 2 records the image according to the image data inputted through the reader section 1 and the facsimile section 3 on a record medium. The facsimile section 3 compresses the image data to which the so-called reception which is

connected to the reader section 1, elongates the compression image data which received through the dial-up line, and transmits the this elongated image data to the reader section 1 was performed, and the facsimile section 3 has been transmitted from the reader section 1, and transmits the this compressed image data to the phase hand set up through the dial-up line. The hard disk 4 is connected to the facsimile section 3, and the compression image data which received can be saved temporarily. Moreover, an external device 11 is a host computer, and as it is mentioned later, it rewrites memory in the reader section 1.

[0026] Hereafter, the reader section 1 and the printer section 2 are explained to a detail. In this operation gestalt, it has the reader section 1 and the printer section 2 as equipment of one, and the sectional side elevation is shown in drawing 2 . In the reader section 1, 101 is a manuscript feeding device, feeds up to platen glass 102 with one manuscript at a time sequentially from the last page, and discharges the manuscript on platen glass 102 after reading actuation termination of a manuscript. If a manuscript is conveyed on platen glass 102, a lamp 103 will light up and the exposure scan of the manuscript will be carried out by starting migration of the scanner unit 104. The reflected light from the manuscript at this time is led to CCD series (Following CCD is called) 109 with a mirror 105,106,107 and a lens 108. Thus, the image data of the manuscript scanned on platen glass 102 is read by CCD109. The image data outputted from CCD109 is transmitted to the printer section 2 or the facsimile section 3, after a predetermined image processing is performed.

[0027] 221 is a laser driver, drives the laser light-emitting part 201, and makes the laser beam according to the image data outputted from the reader section 1 emit light in the printer section 2. This laser beam is irradiated by the photoconductor drum 202, and the latent image according to a laser beam is processed by the photoconductor drum 202. The part of the latent image of this photoconductor drum 202 adheres to a developer with a development counter 203. And to the timing which synchronized with exposure initiation of a laser beam, paper is fed to the recording paper from either a cassette 204 and the cassette 205, it conveys to the imprint section 206, and the developer to which the photoconductor drum 202 adhered is imprinted on this recording paper. The recording paper with which the developer got is conveyed by the fixing section 207, and the recording paper is fixed to a developer by being heated and pressurized. The recording paper which passed the fixing section 207 is discharged with the discharge roller 208. By containing the discharged detail paper into each bottle, a sorter 220 classifies the detail paper. In addition, when the classification in a sorter 220 is not set up, the recording paper is contained into the best bottle. Moreover, when double-sided record is set up, after even the discharge roller 208 conveys the recording paper, the hand of cut of the discharge roller 208 is reversed, and the recording paper is led to a re-feeding conveyance way by the flapper 209. Moreover, when multiplex record is set up, it leads to a re-feeding conveyance way by the flapper 209 so that even the discharge roller 208 may not convey the recording paper. The recording paper led to the re-feeding conveyance way is fed to the imprint section 206 to the timing mentioned above.

[0028] The detail block configuration of the reader section 1 is shown in drawing 3 . In drawing 3 , the A/D-SH section in which 109 performs CCD and 110 performs A/D conversion and a shading compensation, the image-processing section in which 111 performs various image processings, the I/F section in which 113 manages an interface with the facsimile section 3, the control unit to which, as for 115, directions input, condition information of equipment, etc. are performed by the operator, and 117 are the I/F sections which manage an interface with an external device 11, and it has SCSI, RS-232C, etc.

[0029] 114 is CPU which controls each configuration of the reader section 1 in generalization, and 116 is the memory which stored the control program referred to and performed by CPU114. Memory 116 is constituted by EEPROM etc., is rewritten in this operation gestalt, and is the target memory.

[0030] As for the image data outputted from CCD109, a shading compensation is performed while analog-to-digital conversion is performed in the A/D-SH section 110. The image data processed by the A/D-SH section 110 is transmitted to the facsimile section 3 through the I/F section 113 while it is transmitted to the printer section 2 through the image-processing section

111. CPU114 controls the image-processing section 111 and the I/F section 113 according to the contents of a setting set up by the control unit 115. For example, after making trimming processing perform in the image-processing section 111, it is made to transmit to the printer section 2, when the copy mode which copies by performing trimming processing by the control unit 115 is set up. Moreover, when the facsimile transmitting mode is set up by the control unit 115, the control command according to image data and the set-up mode is made to transmit to the facsimile section 3 from the I/F section 113. The control program of CPU114 which performs such processing like mentioned above is memorized by memory 116. Moreover, memory 116 is used also as a working area of CPU114.

[0031] Next, the detail configuration of memory 116 is explained. Drawing 4 is the block diagram showing the configuration of the memory 116 shown in drawing 3 . Memory 116 is constituted by a flash ROM 1161, and EPROM1162 and RAM1163 in drawing 4 . Moreover, 118 and 119 are the address buses and data buses of CPU114, respectively. A flash ROM 1161 is rewritable nonvolatile memory which has memorized the control program for the normal operation of the reader section 1, and consists of an EEPROM etc. EPROM1162 has memorized the download program at the time of rewriting a flash ROM 1161. Moreover, RAM1163 is used as the backup data storage of the reader section 1, and a working area of CPU114.

[0032] Hereafter, the actuation in the case of performing the so-called version up processing which rewrites the control program of the reader section 1 by the external device 11 in the image processing system 10 of a configuration as mentioned above is considered. At this time, an external device 11 is a host computer and transmits the control program memorized in the flash ROM 1161 shown in drawing 4 through the interface 117 of RS-232C to an image processing system 10 side. Then, CPU114 makes a flash ROM 1161 memorize the received control program, referring to the download program memorized by EPROM1162.

[0033] In this case, the flash ROM 1161 is rewriting mode and cannot perform the usual read-out actuation. Therefore, in the reader section 1, it will be in the condition that normal operation cannot be performed. Then, in this operation gestalt, in case a flash ROM 1161 is rewritten, that is notified to the printer section 2 and the facsimile section 3. And in the printer section 2 and the facsimile section 3, the whole of the actuation is stopped about the module which cannot operate if the reader section 1 is not operating, and even if the reader section 1 is not operating, about the module which can operate, actuation is continued as it is. For example, in this operation gestalt, only the function to save the compression image data which received through the dial-up line in the facsimile section 3 at a hard disk 4 enables ****** actuation in the condition of the reader section 1.

[0034] Here, the detail configuration of the facsimile section 3 is shown in the block diagram of drawing 5 . In drawing 5 , 31 is CPU which controls actuation of the facsimile section 3, and 32 is the memory holding the control program in the facsimile section 3. It is the nonvolatile memory which is not rewritable (mask ROM etc.), and memory 32 is equipped with the receiving module and the transmitting module as a control program. 33 and 35 are the I/F sections which take an interface with communications-partner equipment and the reader section 1, respectively, and 34 is the image-processing section which performs elongation processing of a receiving image, compression processing of a transmitting image, etc. In addition, it is elongated in the image-processing section 34, and the image data received through I/F33 in the facsimile section 3 is stored in a hard disk 4.

[0035] The flow chart shown in drawing 6 is referred to hereafter, and the detail of actuation of the reader section 1 at the time of memory rewriting activation of this operation gestalt is explained. The program which the processing shown in the flow chart of drawing 6 shows the processing at the time of downloading the flash ROM 1161 of the reader section 1, and realizes this processing is beforehand memorized by EPROM1162 as a download program. This download program is started by rewriting from an external device 11 and receiving the command of activation, and is executed by CPU114.

[0036] If the reader section 1 rewrites from the host computer of an external device 11 and receives the command of activation, it will wait to be judged, and to become return and rewritable at step S101, if it is not rewritable whether a control program is rewritable in step

S101 first. Here, the case where current copy processing, the facsimile transmission / reception of an image processing system 10, etc. are working, it is intermediate states, such as a paper jam and those without paper, as a condition which is not rewritable, or they are some abnormal conditions, such as abnormality heating of a heating roller, can be considered.
[0037] Progressing to step S102 at step S101, if a control program is rewritable, CPU114 transmits the rewriting initiation command which shows that rewriting of a control program was started to the printer section 2 and the facsimile section 3. At this time, even if a control program is rewriting CPU114, it adds the information on the function in which it can operate, as functional information to the rewriting initiation command to transmit.
[0038] In the reader section 1, it has the list of a module which operates in the facsimile section 3 in memory 116. That is, it has the information about the receiving module and transmitting module in the facsimile section 3. In addition, CPU114 may be made to ask the module in memory 32 to CPU31 of the facsimile section 3.
[0039] Thus, in case it rewrites in step S102 and an initiation command is transmitted, the module which can operate in the facsimile section 3 can be judged. For example, what is necessary is just to form the flag which shows whether it can operate at the time of rewriting in the module list of operation in memory 116. In the receiving module in the facsimile section 3, since the received signal is stored in a hard disk 4, even if the memory 116 in the reader section 1 rewrites this and it is inside, it can operate, but by the transmitting module, since the reader section 1 needs to generate a sending signal, it cannot operate during rewriting.
[0040] And it progresses to step S103, and CPU114 is rewritten and displays the operating state under activation on a control unit 115. In this operation gestalt, the purport in which the display of the purport which is [rewriting] under activation and the auto-receipt of facsimile are possible is displayed.
[0041] Then, it progresses to step S104 and rewriting of a control program is performed to a flash ROM 1161. At this time, only the function (receiving module in the facsimile section 3) shown using the functional information which rewrote at step S102 and was added to the initiation command can operate. That is, during rewriting activation, it is possible to save the compression image data which received through the telephone line in the facsimile section 3 at a hard disk 4.
[0042] After rewriting of a flash ROM 1161 is completed, it progresses to step S105, and the rewriting quit command which shows that rewriting of a control program ended CPU114 in the printer section 2 and the facsimile section 3 is transmitted.
[0043] Then, it progresses to step S106, and CPU114 displays the purport in which normal operation is possible on a control unit 115, and returns to normal operation after that. For example, in this operation gestalt, if reception was performed in the facsimile section 3 during rewriting activation, the received data stored in the hard disk 4 will be outputted from the printer section 2.
[0044] In addition, when the function of an image processing system 10 changes a lot by rewriting of a control program, once turning OFF the body power source of an image processing system 10, reboot may be applied by setting to ON again. In this case, in step S106, a display to that effect is performed to a control unit 115, and reboot is demanded from an operator.
[0045] Next, the flow chart shown in drawing 7 is referred to, and actuation of the facsimile section 3 at the time of memory rewriting activation is explained to a detail.
[0046] The processing shown in the flow chart of drawing 7 shows the processing in the FAKURIMIRI section 3 at the time of downloading the flash ROM 1161 of the reader section 1. The program which realizes this processing is held at ROM which is not illustrated in the facsimile section 3, and is started by rewriting from CPU114 and receiving an initiation command.

[0047] The module (receiving module) which can operate is chosen from the functional information to which the facsimile section 3 rewrites from the reader section 1, and receives an initiation command, which it was not rich and was received in step S201 and which rewrites and is added to the initiation command in the facsimile section 3. Next, it progresses to step S202 and the facsimile section 3 is changed into the condition that only the module which can operate

can be performed. And it judges whether it progressed to step S203, and rewrote from the reader section 1, and the quit command was received. Actuation of only the module in step S202 which can be operated is continued until it receives return and a rewriting quit command to step S202, if it has not received. If it rewrites in step S203 and a quit command is received, it will progress to step S204, and it returns to the usual actuation.

[0048] In addition, in this operation gestalt, it explained for being only a receiving module in the FAKURIMIRI section 3 as a module which can operate during rewriting of a control program, but if it is the function which does not need the direct control by the reader section 1, not only the facsimile section 3 but this invention is applicable.

[0049] According to this operation gestalt, even if the control program of an image processing system is rewriting to the appearance explained above, about the function in which ****** actuation is possible, actuation can be continued as it is at it in actuation of this control program. Therefore, it is upgradable suitably, working an image processing system efficiently.

[0050] The 2nd operation gestalt concerning this invention is explained below the <2nd operation gestalt>.

[0051] Drawing 8 is the block diagram showing the configuration of the image processing system in the 2nd operation gestalt. In drawing 8 , 51 is the reader section, reads the manuscript image laid in the non-illustrated manuscript base, and outputs the image data according to this manuscript image to the printer section 52 and image I/O control unit 53. The printer section 52 records and outputs the image according to the image data transmitted from the reader section 51 and image I/O control unit 53 in the record paper. It connects with the reader section 51 and image I/O control unit 53 consists of the facsimile section 54, the file section 55, the computer interface section 57, the formatter section 58, the image memory section 59, and core section 60 grade.

[0052] The facsimile section 54 elongates the compression image data which received through the dial-up line, and transmits the this elongated image data to the core section 60. Moreover, it is transmitted from the core section 60, image data is compressed, and the this compressed image data is transmitted to the destination specified through the dial-up line. The hard disk 62 is connected to the facsimile section 54, and the compression image data which received can be saved temporarily.

[0053] The Magnetic-Optical disk drive unit 56 is connected to the file section 55. The file section 55 compresses the image data transmitted from the core section 60, and is made to memorize it with the keyword for searching this image data to the removable magneto-optic disk set to the Magnetic-Optical disk drive unit 56. Moreover, the file section 55 searches the compression image data memorized by the magneto-optic disk based on the keyword transmitted through the core section 60. And the searched compression image data is read, it elongates, and the this elongated image data is transmitted to the core section 60.

[0054] The computer interface section 57 is a part which manages the interface between a personal computer or a workstation (PC/WS) 61, and the core section 60. The formatter section 58 develops expression grinding code data for the image transmitted from PC/WS61 to the image data of a format recordable in the printer section 52. The image memory section 59 memorizes temporarily the data transmitted from PC/WS61.

[0055] In addition, although later mentioned about the detail of the core section 60, the core section 60 controls the data flow between each of the reader section 51, the facsimile section 54, the file section 55, the computer interface section 57, the formatter section 58, and the image memory section 59. Moreover, in the 2nd operation gestalt, memory in the reader section 51 shall be rewritten by using an external device 63 as a host computer.

[0056] In addition, although it has the reader section 1 and the printer section 2 as equipment of one in the 2nd operation gestalt, since the sectional side elevation is the same as that of drawing 2 shown in the 1st operation gestalt mentioned above, explanation is omitted.

[0057] The detail block configuration of the reader section 51 is shown in drawing 9 . In drawing 9 , the A/D-SH section in which 159 performs CCD and 150 performs A/D conversion and a shading compensation, the image-processing section in which 151 performs various image processings, the I/F section in which 153 manages an interface with image I/O control unit 53,

the control unit to which, as for 155, directions input, condition information of equipment, etc. are performed by the operator, and 157 are the I/F sections which manage an interface with an external device 11, and it has SCSI, RS-232C, etc.
[0058] 154 is CPU which controls each configuration of the reader section 51 in generalization, and 156 is the memory which stored the control program referred to and performed by CPU154. Memory 156 is constituted by EEPROM etc., is rewritten in this operation gestalt, and is the target memory.
[0059] As for the image data outputted from CCD159, a shading compensation is performed while analog-to-digital conversion is performed in the A/D-SH section 150. The image data processed by the A/D-SH section 150 is transmitted to the core section 60 of image I/O control unit 53 through the I/F section 153 while it is transmitted to the printer section 2 through the image-processing section 151. CPU154 controls the image-processing section 151 and the I/F section 153 according to the contents of a setting set up by the control unit 155. For example, after making trimming processing perform in the image-processing section 151, it is made to transmit to the printer section 2, when the copy mode which copies by performing trimming processing by the control unit 155 is set up. Moreover, when the facsimile transmitting mode is set up by the control unit 155, the control command according to image data and the set-up mode is made to transmit to the core section 60 from the I/F section 153. The control program of CPU154 which performs such processing like mentioned above is memorized by memory 156. Moreover, memory 156 is used also as a working area of CPU154.
[0060] The detail block configuration of the core section 60 is shown in drawing 10 . The I/F section in which 120 takes an interface with other configurations in image I/O control unit 53, the data-processing section in which 121 performs an image processing, the I/F section in which 122 takes an interface with the reader section 51, CPU by which 123 controls the core section 60 whole, and 124 are the memory which stored the control program performed by CPU123 [in the core section 60].
[0061] The image data and control command which have been transmitted from the reader section 51 are inputted into the data-processing section 121 and CPU123, respectively. Image processings, such as rotation and variable power, are performed in the data-processing section 121, and the transmitted image data is transmitted through the I/F section 120 according to the contents of control command to the facsimile section 54, the file section 55, or the computer interface section 57.
[0062] Moreover, after the code data showing an image inputted through the computer interface 57 are transmitted to the data-processing section 121, they are transmitted to the formatter section 58. And after being developed by image data in the formatter section 58, this image data is transmitted to the data-processing section 121, and is transmitted to the facsimile section 54 or the printer section 52.
[0063] After the image data from the facsimile section 54 is transmitted to the data-processing section 121, it is transmitted to the printer section 52, the file section 55, or the computer interface section 57. Moreover, after the image data from the file section 55 is transmitted to the data-processing section 121, it is transmitted to the printer section 52, the facsimile section 54, and the computer interface section 57.
[0064] CPU123 performs control which was mentioned above according to the control program memorized by memory 124 and the control command transmitted from the reader section 51. In addition, memory 124 is used also as a working area of CPU123.
[0065] It is possible to perform processing which was explained above and which compounded [in / like / the image processing system of the 2nd operation gestalt] functions, such as reading of a manuscript image, a print of an image, transmission and reception of an image, preservation of an image, and I/O of the data from a computer, focusing on the core section 60.
[0066] Next, the detail configuration of the memory 156 in the reader section 51 is explained. Drawing 11 is the block diagram showing the configuration of the memory 156 shown in drawing 9 . Memory 156 is constituted by a flash ROM 1561 and RAM1562 in drawing 11 . Moreover, 158 and 159 are the address buses and data buses of CPU154, respectively. The flash ROM 1561 has memorized the control program for the normal operation of the reader section 51, and is the

rewritable nonvolatile memory of EEPROM etc. Moreover, RAM1563 is used as the backup data storage of the reader section 51, and a working area of CPU154.
[0067] The internal configuration of a flash ROM 1561 is shown in drawing 12 here. As shown in drawing 12 , a flash ROM 1561 is divided into 16 blocks shown by 1100-1115, and the module according to individual is stored for every block. In case a flash ROM 1561 rewrites, although it rewrites and becomes the mode, it is the thing which cannot perform the usual read-out actuation and for which rewriting is interrupted temporarily, and the read-out actuation of it is attained. Moreover, a flash ROM 1561 is rewritable in this block unit.
[0068] In the flash ROM 1561 shown in drawing 12 , in case a flash ROM 1561 is rewritten for block 1100, the download program referred to by CPU154 is memorized, and in order that only this block may forbid rewriting, it is protected in hard. In case it rewrites to other blocks, CPU154 controls transmitting the download program memorized by the block 1100 to RAM1562, and referring to the this transmitted program. Moreover, block 1101 to the block 1107 has memorized the control program about the reader section 51. Moreover, block 1108 to the block 1112 has memorized the program of each control unit, and makes block 1115 a reserve field from block 1113.
[0069] In the image processing system of the 2nd operation gestalt which makes hereafter a configuration which was mentioned above, the actuation in the case of performing the so-called version up processing which rewrites the control program of the reader section 51 by the external device 63 is considered. At this time, an external device 63 is a host computer and transmits the control program memorized in the flash ROM 1561 shown in drawing 11 through the interface 157 of RS-232C to an image processing system side. Then, CPU154 makes a flash ROM 1561 memorize the received control program, referring to the download program transmitted to RAM1562.
[0070] Although the time of rewriting mode becomes impossible as for the usual read-out, read-out of the flash ROM 1561 in the 2nd operation gestalt becomes possible by interrupting rewriting temporarily. Then, in the 2nd operation gestalt, in case a flash ROM 1561 is rewritten, the following control is performed.
[0071] That is, about the module which can be performed combining the program within a block unrelated to the block to rewrite, read-out is made possible. And when a run command occurs to the module which can be performed at the time of rewriting mode, after interrupting rewriting temporarily, performing preferentially actuation to the module which can be performed and completing this actuation, it rewrites again. For example, considering the case where rewriting for adding the function in the file manipulation section shown especially in the block 1111 of drawing 12 to the control program in a flash ROM 1561 is performed, performing the usual processing in this case about each control unit (it corresponding to blocks 1109, 1110, and 1112, respectively) of a copy, facsimile, and a printer is permitted.
[0072] Next, the flow chart shown in drawing 13 is referred to, and actuation of the reader section 51 at the time of memory rewriting activation is explained to a detail. The program which the processing shown in the flow chart of drawing 13 shows the processing at the time of downloading the flash ROM 1561 of the reader section 51, and realizes this processing is beforehand memorized by the block 1100 of a flash ROM 1561. By rewriting from an external device 11 and receiving the command of activation, this download program is transmitted to RAM1562, and is executed by CPU154.
[0073] If the reader section 51 rewrites from the host computer of an external device 11 and receives the command of activation, it will wait to be judged, and to become return and rewritable at step S301, if it is not rewritable whether a control program is rewritable in step S301 first. Here, the case where current copy processing, the facsimile transmission / reception of an image processing system 10, etc. are working, it is intermediate states, such as a paper jam and those without paper, as a condition which is not rewritable, or they are some abnormal conditions, such as abnormality heating of a heating roller, can be considered.
[0074] Progressing to step S302 at step S301, if a control program is rewritable, CPU154 stops all the functions about the module within the block which is a candidate for rewriting. For example, as mentioned above, when rewriting to the file manipulation module shown in block 1111

is performed, CPU154 displays the purport whose file manipulation becomes impossible from this on a control unit 155, and publishes the command which shows that the file section 55 is invalid to image I/O control unit 53. In addition, in a control unit 155, all displays about file manipulation may be suspended at this time.
[0075] Next, it progresses to step S303 and an image processing system shifts to rewriting mode. And in step S304, rewriting of a control program (in this case, only block 1111) is performed to a flash ROM 1561.
[0076] And after rewriting of a flash ROM 1561 is completed, it progresses to step S305 and rewriting mode is ended. Then, in step S306, the module stopped at step S302 for rewriting is rebooted.
[0077] Although memory rewriting processing in the 2nd operation gestalt is performed as it explained above, in the 2nd operation gestalt, it is characterized by the thing which were mentioned above and for which other actuation is given priority to and performed during memory rewriting like. Hereafter, the interruption interruption processing under rewriting processing is explained with reference to the flow chart of drawing 14 .
[0078] Suppose [be / it / under / rewriting processing activation / which is shown in step S304 of drawing 13 mentioned above / setting] that interruption of the activation demand to a certain module which can be operated was received. For example, the print run command to the module in the printer control unit of the block 1112 shown in drawing 12 etc. corresponds to this interrupt request. Then, CPU154 starts interruption interruption processing. First, in step S311, it is interrupted temporarily and CPU154 changes rewriting to the block 1111 of a flash ROM 1561 into the condition which can read a flash ROM 1561.
[0079] Next, it progresses to step S312 and the module with an operational request which can be operated is performed. And if actuation of this module is completed, it will progress to step S313, and it judges whether there is any operational request interruption to other modules which can be operated. When there is interruption to other modules, processing returns to step S312 and performs the module concerned.
[0080] On the other hand, if other interruption cannot be found in step S313, it will progress to step S314, and momentary interruption of the rewriting processing by step S311 is canceled, and it changes into the condition that a flash ROM 1561 is rewritable.
[0081] And return and rewriting processing can be resumed to step S304 shown in drawing 13 .
[0082] Even if the control program of an image processing system is rewriting to the appearance explained above according to the 2nd operation gestalt, about high processing of a priority, rewriting processing can be interrupted to it, this processing can be performed, and rewriting processing can be rerun after the termination. Therefore, it is upgradable suitably, working an image processing system efficiently.
[0083] Moreover, even if it applies this invention to the system which consists of two or more devices, such as a host computer, an interface, and a printer, it may be applied to the equipment which consists of one devices, such as a copying machine. Moreover, it cannot be overemphasized that this invention can be applied also when carrying out by supplying a program to a system or equipment. In this case, the storage which stored the program concerning this invention will constitute this invention. And the system or equipment operates by the method defined beforehand by reading the program from this storage to a system or equipment.
[0084]
[Effect of the Invention] According to this invention, even if the control program of an image processing system is rewriting to the appearance explained above, about the function in which ****** actuation is possible, actuation can be continued as it is at it in actuation of this control program.
[0085] Moreover, even if a control program is rewriting, about high processing of a priority, rewriting processing can be interrupted, this processing can be performed and rewriting processing can be rerun after the termination.
[0086] Therefore, according to this invention, it is upgradable suitably, working an image processing system efficiently.
[0087]

[Translation done.]

* NOTICES *

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the image processing system which rewrites the control program provided in an image processing system, and its approach, concerning an image processing system and its approach.

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PRIOR ART

[Description of the Prior Art] PROM (programmable ROM) which can write in a program, and EPROM (erasable PROM) of an ultraviolet-rays elimination mold were used the mask ROM which wrote in fixed data (control program) in the production process from before as nonvolatile memory which stores the control program in an image processing system, and after manufacture. In recent years, EEPROM (electrically erasable and programmable ROM) which is rewritable nonvolatile memory electrically is developed as memory replaced with these, and using these also in an image processing system is proposed. By using the nonvolatile memory in which such rewriting is possible, it became possible easily for it to become unnecessary to perform ROM exchange in the case of correction of a control program and modification, and to rewrite this program on an onboard. Thereby, when it was the image processing system connected through the network, the control program could also be rewritten using the communication link from the remote place.

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, even if the control program of an image processing system is rewriting to the appearance explained above, about the function in which ****** actuation is possible, actuation can be continued as it is at it in actuation of this control program.
[0085] Moreover, even if a control program is rewriting, about high processing of a priority, rewriting processing can be interrupted, this processing can be performed and rewriting processing can be rerun after the termination.
[0086] Therefore, according to this invention, it is upgradable suitably, working an image processing system efficiently.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the image processing system which stored the control program in the rewritable nonvolatile memory mentioned above, when this control program was rewritten, this image processing system needed to stop the whole of the function. That is, since other processings were not able to be performed during rewriting actuation of memory, there was a problem that processing effectiveness will fall.
[0004] It is made in order that this invention may solve the technical problem mentioned above, and it aims at offering the image processing system which can perform a certain image processing, and its approach during rewriting actuation of a control program.

[Translation done.]

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MEANS

[Means for Solving the Problem] The image processing system of this invention is equipped with the following configurations as a way stage for attaining the purpose mentioned above.
[0006] That is, it is the image processing system which held for a storage means to by_which a control program is rewritable, and it has the control means which controls the whole equipment according to said control program, and the rewriting means which rewrites said control program, said control means directs processing in_which it can operate in the case of rewriting by said rewriting means, and it is characterized by to permit actuation of this processing in the case of rewriting by said rewriting means.
[0007] For example, it is characterized by said storage means containing a flash ROM.
[0008] For example, it is characterized by said storage means containing EEPROM.
[0009] For example, processing in which it can operate in the case of rewriting by said rewriting means is characterized by said control program being the processing which does not involve directly.
[0010] Furthermore, the storage means in which said rewriting is possible is characterized by processing in which it has the 2nd control program for the 2nd different storage means, and can operate in the case of rewriting by said rewriting means being processing by said 2nd control program.
[0011] For example, said 2nd storage means is characterized by the ability not to rewrite.
[0012] Furthermore, it has an information means to report a device status to an operator, and said information means is characterized by reporting the purport which is under rewriting in the case of rewriting by said rewriting means.
[0013] For example, said information means is characterized by reporting processing in which it can operate in the case of rewriting by said rewriting means.
[0014] Moreover, the control means which is the image processing system held for a storage means by which a control program is rewritable, and controls the whole equipment according to said control program, Have the rewriting means which rewrites said control program, and said storage means divides and holds said control program to two or more modules. Said rewriting means rewrites in said module unit, said control means directs processing in which it can operate in the case of rewriting by said rewriting means, from said two or more modules, and it is characterized by permitting actuation of this module in the case of rewriting by said rewriting means.
[0015] For example, said control means is characterized by interrupting said rewriting, when said directed module operates in the case of rewriting by said rewriting means.
[0016] For example, it is characterized by said storage means containing a flash ROM.
[0017] For example, it is characterized by said storage means containing EEPROM.
[0018] Furthermore, it has an information means to report a device status to an operator, and said information means is characterized by reporting the purport which is under rewriting in the case of rewriting by said rewriting means.
[0019] For example, said information means is characterized by reporting processing in which it can operate in the case of rewriting by said rewriting means.
[0020] The image-processing approach of this invention is equipped with the following processes

as a way method for attaining the purpose mentioned above.
[0021] That is, it is the image-processing approach in the image processing system held for a storage means by which a control program is rewritable, and processing in which it can operate in case said control program is rewritten is directed, and it is characterized by permitting actuation of this processing in the case of rewriting.
[0022] Moreover, it is the image-processing approach in the image processing system held for a storage means by which a control program is rewritable, and said storage means divides and holds said control program to two or more modules, processing in which it can operate in case said control program is rewritten in said module unit is directed from said two or more modules, and it is characterized by permitting actuation of this module in the case of rewriting.
[0023]
[Embodiment of the Invention] Hereafter, 1 operation gestalt concerning this invention is explained to a detail with reference to a drawing.
[0024] <1st operation gestalt> drawing 1 is the block diagram showing the configuration of the image processing system in this operation gestalt. In drawing 1 , 10 is an image processing system, 11 is external devices, such as a host computer, and the predetermined interface connects mutually. Moreover, for 1, as for the printer section and 3, in an image processing system 10, the reader section and 2 are [the facsimile section and 4] hard disks.
[0025] Hereafter, the actuation in the above-mentioned configuration is explained. First, the reader section 1 reads optically the image of the manuscript laid in the non-illustrated manuscript base, and outputs the image data according to a manuscript image to the printer section 2 and the facsimile section 3. In addition, in the image processing system 10 of this operation gestalt, it shall have the memory set as the rewriting object of the program mentioned later in the reader section 1. The printer section 2 records the image according to the image data inputted through the reader section 1 and the facsimile section 3 on a record medium. The facsimile section 3 compresses the image data to which the so-called reception which is connected to the reader section 1, elongates the compression image data which received through the dial-up line, and transmits the this elongated image data to the reader section 1 was performed, and the facsimile section 3 has been transmitted from the reader section 1, and transmits the this compressed image data to the phase hand set up through the dial-up line. The hard disk 4 is connected to the facsimile section 3, and the compression image data which received can be saved temporarily. Moreover, an external device 11 is a host computer, and as it is mentioned later, it rewrites memory in the reader section 1.
[0026] Hereafter, the reader section 1 and the printer section 2 are explained to a detail. In this operation gestalt, it has the reader section 1 and the printer section 2 as equipment of one, and the sectional side elevation is shown in drawing 2 . In the reader section 1, 101 is a manuscript feeding device, feeds up to platen glass 102 with one manuscript at a time sequentially from the last page, and discharges the manuscript on platen glass 102 after reading actuation termination of a manuscript. If a manuscript is conveyed on platen glass 102, a lamp 103 will light up and the exposure scan of the manuscript will be carried out by starting migration of the scanner unit 104. The reflected light from the manuscript at this time is led to CCD series (Following CCD is called) 109 with a mirror 105,106,107 and a lens 108. Thus, the image data of the manuscript scanned on platen glass 102 is read by CCD109. The image data outputted from CCD109 is transmitted to the printer section 2 or the facsimile section 3, after a predetermined image processing is performed.
[0027] 221 is a laser driver, drives the laser light-emitting part 201, and makes the laser beam according to the image data outputted from the reader section 1 emit light in the printer section 2. This laser beam is irradiated by the photoconductor drum 202, and the latent image according to a laser beam is processed by the photoconductor drum 202. The part of the latent image of this photoconductor drum 202 adheres to a developer with a development counter 203. And to the timing which synchronized with exposure initiation of a laser beam, paper is fed to the recording paper from either a cassette 204 and the cassette 205, it conveys to the imprint section 206, and the developer to which the photoconductor drum 202 adhered is imprinted on this recording paper. The recording paper with which the developer got is conveyed by the fixing

section 207, and the recording paper is fixed to a developer by being heated and pressurized. The recording paper which passed the fixing section 207 is discharged with the discharge roller 208. By containing the discharged detail paper into each bottle, a sorter 220 classifies the detail paper. In addition, when the classification in a sorter 220 is not set up, the recording paper is contained into the best bottle. Moreover, when double-sided record is set up, after even the discharge roller 208 conveys the recording paper, the hand of cut of the discharge roller 208 is reversed, and the recording paper is led to a re-feeding conveyance way by the flapper 209. Moreover, when multiplex record is set up, it leads to a re-feeding conveyance way by the flapper 209 so that even the discharge roller 208 may not convey the recording paper. The recording paper led to the re-feeding conveyance way is fed to the imprint section 206 to the timing mentioned above.

[0028] The detail block configuration of the reader section 1 is shown in drawing 3 . In drawing 3 , the A/D-SH section in which 109 performs CCD and 110 performs A/D conversion and a shading compensation, the image-processing section in which 111 performs various image processings, the I/F section in which 113 manages an interface with the facsimile section 3, the control unit to which, as for 115, directions input, condition information of equipment, etc. are performed by the operator, and 117 are the I/F sections which manage an interface with an external device 11, and it has SCSI, RS-232C, etc.

[0029] 114 is CPU which controls each configuration of the reader section 1 in generalization, and 116 is the memory which stored the control program referred to and performed by CPU114. Memory 116 is constituted by EEPROM etc., is rewritten in this operation gestalt, and is the target memory.

[0030] As for the image data outputted from CCD109, a shading compensation is performed while analog-to-digital conversion is performed in the A/D-SH section 110. The image data processed by the A/D-SH section 110 is transmitted to the facsimile section 3 through the I/F section 113 while it is transmitted to the printer section 2 through the image-processing section 111. CPU114 controls the image-processing section 111 and the I/F section 113 according to the contents of a setting set up by the control unit 115. For example, after making trimming processing perform in the image-processing section 111, it is made to transmit to the printer section 2, when the copy mode which copies by performing trimming processing by the control unit 115 is set up. Moreover, when the facsimile transmitting mode is set up by the control unit 115, the control command according to image data and the set-up mode is made to transmit to the facsimile section 3 from the I/F section 113. The control program of CPU114 which performs such processing like mentioned above is memorized by memory 116. Moreover, memory 116 is used also as a working area of CPU114.

[0031] Next, the detail configuration of memory 116 is explained. Drawing 4 is the block diagram showing the configuration of the memory 116 shown in drawing 3 . Memory 116 is constituted by a flash ROM 1161, and EPROM1162 and RAM1163 in drawing 4 . Moreover, 118 and 119 are the address buses and data buses of CPU114, respectively. A flash ROM 1161 is rewritable nonvolatile memory which has memorized the control program for the normal operation of the reader section 1, and consists of an EEPROM etc. EPROM1162 has memorized the download program at the time of rewriting a flash ROM 1161. Moreover, RAM1163 is used as the backup data storage of the reader section 1, and a working area of CPU114.

[0032] Hereafter, the actuation in the case of performing the so-called version up processing which rewrites the control program of the reader section 1 by the external device 11 in the image processing system 10 of a configuration as mentioned above is considered. At this time, an external device 11 is a host computer and transmits the control program memorized in the flash ROM 1161 shown in drawing 4 through the interface 117 of RS-232C to an image processing system 10 side. Then, CPU114 makes a flash ROM 1161 memorize the received control program, referring to the download program memorized by EPROM1162.

[0033] In this case, the flash ROM 1161 is rewriting mode and cannot perform the usual read-out actuation. Therefore, in the reader section 1, it will be in the condition that normal operation cannot be performed. Then, in this operation gestalt, in case a flash ROM 1161 is rewritten, that is notified to the printer section 2 and the facsimile section 3. And in the printer section 2 and

the facsimile section 3, the whole of the actuation is stopped about the module which cannot operate if the reader section 1 is not operating, and even if the reader section 1 is not operating, about the module which can operate, actuation is continued as it is. For example, in this operation gestalt, only the function to save the compression image data which received through the dial-up line in the facsimile section 3 at a hard disk 4 enables ****** actuation in the condition of the reader section 1.

[0034] Here, the detail configuration of the facsimile section 3 is shown in the block diagram of drawing 5 . In drawing 5 , 31 is CPU which controls actuation of the facsimile section 3, and 32 is the memory holding the control program in the facsimile section 3. It is the nonvolatile memory which is not rewritable (mask ROM etc.), and memory 32 is equipped with the receiving module and the transmitting module as a control program. 33 and 35 are the I/F sections which take an interface with communications-partner equipment and the reader section 1, respectively, and 34 is the image-processing section which performs elongation processing of a receiving image, compression processing of a transmitting image, etc. In addition, it is elongated in the image-processing section 34, and the image data received through I/F33 in the facsimile section 3 is stored in a hard disk 4.

[0035] The flow chart shown in drawing 6 is referred to hereafter, and the detail of actuation of the reader section 1 at the time of memory rewriting activation of this operation gestalt is explained. The program which the processing shown in the flow chart of drawing 6 shows the processing at the time of downloading the flash ROM 1161 of the reader section 1, and realizes this processing is beforehand memorized by EPROM1162 as a download program. This download program is started by rewriting from an external device 11 and receiving the command of activation, and is executed by CPU114.

[0036] If the reader section 1 rewrites from the host computer of an external device 11 and receives the command of activation, it will wait to be judged, and to become return and rewritable at step S101, if it is not rewritable whether a control program is rewritable in step S101 first. Here, the case where current copy processing, the facsimile transmission / reception of an image processing system 10, etc. are working, it is intermediate states, such as a paper jam and those without paper, as a condition which is not rewritable, or they are some abnormal conditions, such as abnormality heating of a heating roller, can be considered.

[0037] Progressing to step S102 at step S101, if a control program is rewritable, CPU114 transmits the rewriting initiation command which shows that rewriting of a control program was started to the printer section 2 and the facsimile section 3. At this time, even if a control program is rewriting CPU114, it adds the information on the function in which it can operate, as functional information to the rewriting initiation command to transmit.

[0038] In the reader section 1, it has the list of a module which operates in the facsimile section 3 in memory 116. That is, it has the information about the receiving module and transmitting module in the facsimile section 3. In addition, CPU114 may be made to ask the module in memory 32 to CPU31 of the facsimile section 3.

[0039] Thus, in case it rewrites in step S102 and an initiation command is transmitted, the module which can operate in the facsimile section 3 can be judged. For example, what is necessary is just to form the flag which shows whether it can operate at the time of rewriting in the module list of operation in memory 116. In the receiving module in the facsimile section 3, since the received signal is stored in a hard disk 4, even if the memory 116 in the reader section 1 rewrites this and it is inside, it can operate, but by the transmitting module, since the reader section 1 needs to generate a sending signal, it cannot operate during rewriting.

[0040] And it progresses to step S103, and CPU114 is rewritten and displays the operating state under activation on a control unit 115. In this operation gestalt, the purport in which the display of the purport which is [rewriting] under activation and the auto-receipt of facsimile are possible is displayed.

[0041] Then, it progresses to step S104 and rewriting of a control program is performed to a flash ROM 1161. At this time, only the function (receiving module in the facsimile section 3) shown using the functional information which rewrote at step S102 and was added to the initiation command can operate. That is, during rewriting activation, it is possible to save the

compression image data which received through the telephone line in the facsimile section 3 at a hard disk 4.
[0042] After rewriting of a flash ROM 1161 is completed, it progresses to step S105, and the rewriting quit command which shows that rewriting of a control program ended CPU114 in the printer section 2 and the facsimile section 3 is transmitted.
[0043] Then, it progresses to step S106, and CPU114 displays the purport in which normal operation is possible on a control unit 115, and returns to normal operation after that. For example, in this operation gestalt, if reception was performed in the facsimile section 3 during rewriting activation, the received data stored in the hard disk 4 will be outputted from the printer section 2.
[0044] In addition, when the function of an image processing system 10 changes a lot by rewriting of a control program, once turning OFF the body power source of an image processing system 10, reboot may be applied by setting to ON again. In this case, in step S106, a display to that effect is performed to a control unit 115, and reboot is demanded from an operator.
[0045] Next, the flow chart shown in drawing 7 is referred to, and actuation of the facsimile section 3 at the time of memory rewriting activation is explained to a detail.
[0046] The processing shown in the flow chart of drawing 7 shows the processing in the FAKURIMIRI section 3 at the time of downloading the flash ROM 1161 of the reader section 1. The program which realizes this processing is held at ROM which is not illustrated in the facsimile section 3, and is started by rewriting from CPU114 and receiving an initiation command.

[0047] The module (receiving module) which can operate is chosen from the functional information to which the facsimile section 3 rewrites from the reader section 1, and receives an initiation command, which it was not rich and was received in step S201 and which rewrites and is added to the initiation command in the facsimile section 3. Next, it progresses to step S202 and the facsimile section 3 is changed into the condition that only the module which can operate can be performed. And it judges whether it progressed to step S203, and rewrote from the reader section 1, and the quit command was received. Actuation of only the module in step S202 which can be operated is continued until it receives return and a rewriting quit command to step S202, if it has not received. If it rewrites in step S203 and a quit command is received, it will progress to step S204, and it returns to the usual actuation.
[0048] In addition, in this operation gestalt, it explained for being only a receiving module in the FAKURIMIRI section 3 as a module which can operate during rewriting of a control program, but if it is the function which does not need the direct control by the reader section 1, not only the facsimile section 3 but this invention is applicable.
[0049] According to this operation gestalt, even if the control program of an image processing system is rewriting to the appearance explained above, about the function in which ****** actuation is possible, actuation can be continued as it is at it in actuation of this control program. Therefore, it is upgradable suitably, working an image processing system efficiently.
[0050] The 2nd operation gestalt concerning this invention is explained below the <2nd operation gestalt>.
[0051] Drawing 8 is the block diagram showing the configuration of the image processing system in the 2nd operation gestalt. In drawing 8 , 51 is the reader section, reads the manuscript image laid in the non-illustrated manuscript base, and outputs the image data according to this manuscript image to the printer section 52 and image I/O control unit 53. The printer section 52 records and outputs the image according to the image data transmitted from the reader section 51 and image I/O control unit 53 in the record paper. It connects with the reader section 51 and image I/O control unit 53 consists of the facsimile section 54, the file section 55, the computer interface section 57, the formatter section 58, the image memory section 59, and core section 60 grade.
[0052] The facsimile section 54 elongates the compression image data which received through the dial-up line, and transmits the this elongated image data to the core section 60. Moreover, it is transmitted from the core section 60, image data is compressed, and the this compressed image data is transmitted to the destination specified through the dial-up line. The hard disk 62

is connected to the facsimile section 54, and the compression image data which received can be saved temporarily.
[0053] The Magnetic-Optical disk drive unit 56 is connected to the file section 55. The file section 55 compresses the image data transmitted from the core section 60, and is made to memorize it with the keyword for searching this image data to the removable magneto-optic disk set to the Magnetic-Optical disk drive unit 56. Moreover, the file section 55 searches the compression image data memorized by the magneto-optic disk based on the keyword transmitted through the core section 60. And the searched compression image data is read, it elongates, and the this elongated image data is transmitted to the core section 60.
[0054] The computer interface section 57 is a part which manages the interface between a personal computer or a workstation (PC/WS) 61, and the core section 60. The formatter section 58 develops expression grinding code data for the image transmitted from PC/WS61 to the image data of a format recordable in the printer section 52. The image memory section 59 memorizes temporarily the data transmitted from PC/WS61.
[0055] In addition, although later mentioned about the detail of the core section 60, the core section 60 controls the data flow between each of the reader section 51, the facsimile section 54, the file section 55, the computer interface section 57, the formatter section 58, and the image memory section 59. Moreover, in the 2nd operation gestalt, memory in the reader section 51 shall be rewritten by using an external device 63 as a host computer.
[0056] In addition, although it has the reader section 1 and the printer section 2 as equipment of one in the 2nd operation gestalt, since the sectional side elevation is the same as that of drawing 2 shown in the 1st operation gestalt mentioned above, explanation is omitted.
[0057] The detail block configuration of the reader section 51 is shown in drawing 9 . In drawing 9 , the A/D-SH section in which 159 performs CCD and 150 performs A/D conversion and a shading compensation, the image-processing section in which 151 performs various image processings, the I/F section in which 153 manages an interface with image I/O control unit 53, the control unit to which, as for 155, directions input, condition information of equipment, etc. are performed by the operator, and 157 are the I/F sections which manage an interface with an external device 11, and it has SCSI, RS-232C, etc.
[0058] 154 is CPU which controls each configuration of the reader section 51 in generalization, and 156 is the memory which stored the control program referred to and performed by CPU154. Memory 156 is constituted by EEPROM etc., is rewritten in this operation gestalt, and is the target memory.
[0059] As for the image data outputted from CCD159, a shading compensation is performed while analog-to-digital conversion is performed in the A/D-SH section 150. The image data processed by the A/D-SH section 150 is transmitted to the core section 60 of image I/O control unit 53 through the I/F section 153 while it is transmitted to the printer section 2 through the image-processing section 151. CPU154 controls the image-processing section 151 and the I/F section 153 according to the contents of a setting set up by the control unit 155. For example, after making trimming processing perform in the image-processing section 151, it is made to transmit to the printer section 2, when the copy mode which copies by performing trimming processing by the control unit 155 is set up. Moreover, when the facsimile transmitting mode is set up by the control unit 155, the control command according to image data and the set-up mode is made to transmit to the core section 60 from the I/F section 153. The control program of CPU154 which performs such processing like mentioned above is memorized by memory 156. Moreover, memory 156 is used also as a working area of CPU154.
[0060] The detail block configuration of the core section 60 is shown in drawing 10 . The I/F section in which 120 takes an interface with other configurations in image I/O control unit 53, the data-processing section in which 121 performs an image processing, the I/F section in which 122 takes an interface with the reader section 51, CPU by which 123 controls the core section 60 whole, and 124 are the memory which stored the control program performed by CPU123 [in the core section 60].
[0061] The image data and control command which have been transmitted from the reader section 51 are inputted into the data-processing section 121 and CPU123, respectively. Image

processings, such as rotation and variable power, are performed in the data-processing section 121, and the transmitted image data is transmitted through the I/F section 120 according to the contents of control command to the facsimile section 54, the file section 55, or the computer interface section 57.
[0062] Moreover, after the code data showing an image inputted through the computer interface 57 are transmitted to the data-processing section 121, they are transmitted to the formatter section 58. And after being developed by image data in the formatter section 58, this image data is transmitted to the data-processing section 121, and is transmitted to the facsimile section 54 or the printer section 52.
[0063] After the image data from the facsimile section 54 is transmitted to the data-processing section 121, it is transmitted to the printer section 52, the file section 55, or the computer interface section 57. Moreover, after the image data from the file section 55 is transmitted to the data-processing section 121, it is transmitted to the printer section 52, the facsimile section 54, and the computer interface section 57.
[0064] CPU123 performs control which was mentioned above according to the control program memorized by memory 124 and the control command transmitted from the reader section 51. In addition, memory 124 is used also as a working area of CPU123.
[0065] It is possible to perform processing which was explained above and which compounded [in / like / the image processing system of the 2nd operation gestalt] functions, such as reading of a manuscript image, a print of an image, transmission and reception of an image, preservation of an image, and I/O of the data from a computer, focusing on the core section 60.
[0066] Next, the detail configuration of the memory 156 in the reader section 51 is explained. Drawing 11 is the block diagram showing the configuration of the memory 156 shown in drawing 9 . Memory 156 is constituted by a flash ROM 1561 and RAM1562 in drawing 11 . Moreover, 158 and 159 are the address buses and data buses of CPU154, respectively. The flash ROM 1561 has memorized the control program for the normal operation of the reader section 51, and is the rewritable nonvolatile memory of EEPROM etc. Moreover, RAM1563 is used as the backup data storage of the reader section 51, and a working area of CPU154.
[0067] The internal configuration of a flash ROM 1561 is shown in drawing 12 here. As shown in drawing 12 , a flash ROM 1561 is divided into 16 blocks shown by 1100-1115, and the module according to individual is stored for every block. In case a flash ROM 1561 rewrites, although it rewrites and becomes the mode, it is the thing which cannot perform the usual read-out actuation and for which rewriting is interrupted temporarily, and the read-out actuation of it is attained. Moreover, a flash ROM 1561 is rewritable in this block unit.
[0068] In the flash ROM 1561 shown in drawing 12 , in case a flash ROM 1561 is rewritten for block 1100, the download program referred to by CPU154 is memorized, and in order that only this block may forbid rewriting, it is protected in hard. In case it rewrites to other blocks, CPU154 controls transmitting the download program memorized by the block 1100 to RAM1562, and referring to the this transmitted program. Moreover, block 1101 to the block 1107 has memorized the control program about the reader section 51. Moreover, block 1108 to the block 1112 has memorized the program of each control unit, and makes block 1115 a reserve field from block 1113.
[0069] In the image processing system of the 2nd operation gestalt which makes hereafter a configuration which was mentioned above, the actuation in the case of performing the so-called version up processing which rewrites the control program of the reader section 51 by the external device 63 is considered. At this time, an external device 63 is a host computer and transmits the control program memorized in the flash ROM 1561 shown in drawing 11 through the interface 157 of RS-232C to an image processing system side. Then, CPU154 makes a flash ROM 1561 memorize the received control program, referring to the download program transmitted to RAM1562.
[0070] Although the time of rewriting mode becomes impossible as for the usual read-out, read-out of the flash ROM 1561 in the 2nd operation gestalt becomes possible by interrupting rewriting temporarily. Then, in the 2nd operation gestalt, in case a flash ROM 1561 is rewritten, the following control is performed.

[0071] That is, about the module which can be performed combining the program within a block unrelated to the block to rewrite, read-out is made possible. And when a run command occurs to the module which can be performed at the time of rewriting mode, after interrupting rewriting temporarily, performing preferentially actuation to the module which can be performed and completing this actuation, it rewrites again. For example, considering the case where rewriting for adding the function in the file manipulation section shown especially in the block 1111 of drawing 12 to the control program in a flash ROM 1561 is performed, performing the usual processing in this case about each control unit (it corresponding to blocks 1109, 1110, and 1112, respectively) of a copy, facsimile, and a printer is permitted.
[0072] Next, the flow chart shown in drawing 13 is referred to, and actuation of the reader section 51 at the time of memory rewriting activation is explained to a detail. The program which the processing shown in the flow chart of drawing 13 shows the processing at the time of downloading the flash ROM 1561 of the reader section 51, and realizes this processing is beforehand memorized by the block 1100 of a flash ROM 1561. By rewriting from an external device 11 and receiving the command of activation, this download program is transmitted to RAM1562, and is executed by CPU154.
[0073] If the reader section 51 rewrites from the host computer of an external device 11 and receives the command of activation, it will wait to be judged, and to become return and rewritable at step S301, if it is not rewritable whether a control program is rewritable in step S301 first. Here, the case where current copy processing, the facsimile transmission / reception of an image processing system 10, etc. are working, it is intermediate states, such as a paper jam and those without paper, as a condition which is not rewritable, or they are some abnormal conditions, such as abnormality heating of a heating roller, can be considered.
[0074] Progressing to step S302 at step S301, if a control program is rewritable, CPU154 stops all the functions about the module within the block which is a candidate for rewriting. For example, as mentioned above, when rewriting to the file manipulation module shown in block 1111 is performed, CPU154 displays the purport whose file manipulation becomes impossible from this on a control unit 155, and publishes the command which shows that the file section 55 is invalid to image I/O control unit 53. In addition, in a control unit 155, all displays about file manipulation may be suspended at this time.
[0075] Next, it progresses to step S303 and an image processing system shifts to rewriting mode. And in step S304, rewriting of a control program (in this case, only block 1111) is performed to a flash ROM 1561.
[0076] And after rewriting of a flash ROM 1561 is completed, it progresses to step S305 and rewriting mode is ended. Then, in step S306, the module stopped at step S302 for rewriting is rebooted.
[0077] Although memory rewriting processing in the 2nd operation gestalt is performed as it explained above, in the 2nd operation gestalt, it is characterized by the thing which were mentioned above and for which other actuation is given priority to and performed during memory rewriting like. Hereafter, the interruption interruption processing under rewriting processing is explained with reference to the flow chart of drawing 14 .
[0078] Suppose [be / it / under / rewriting processing activation / which is shown in step S304 of drawing 13 mentioned above / setting] that interruption of the activation demand to a certain module which can be operated was received. For example, the print run command to the module in the printer control unit of the block 1112 shown in drawing 12 etc. corresponds to this interrupt request. Then, CPU154 starts interruption interruption processing. First, in step S311, it is interrupted temporarily and CPU154 changes rewriting to the block 1111 of a flash ROM 1561 into the condition which can read a flash ROM 1561.
[0079] Next, it progresses to step S312 and the module with an operational request which can be operated is performed. And if actuation of this module is completed, it will progress to step S313, and it judges whether there is any operational request interruption to other modules which can be operated. When there is interruption to other modules, processing returns to step S312 and performs the module concerned.
[0080] On the other hand, if other interruption cannot be found in step S313, it will progress to

step S314, and momentary interruption of the rewriting processing by step S311 is canceled, and it changes into the condition that a flash ROM 1561 is rewritable.
[0081] And return and rewriting processing can be resumed to step S304 shown in drawing 13 .
[0082] Even if the control program of an image processing system is rewriting to the appearance explained above according to the 2nd operation gestalt, about high processing of a priority, rewriting processing can be interrupted to it, this processing can be performed, and rewriting processing can be rerun after the termination. Therefore, it is upgradable suitably, working an image processing system efficiently.
[0083] Moreover, even if it applies this invention to the system which consists of two or more devices, such as a host computer, an interface, and a printer, it may be applied to the equipment which consists of one devices, such as a copying machine. Moreover, it cannot be overemphasized that this invention can be applied also when carrying out by supplying a program to a system or equipment. In this case, the storage which stored the program concerning this invention will constitute this invention. And the system or equipment operates by the method defined beforehand by reading the program from this storage to a system or equipment.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram showing the configuration of the image processing system in 1 operation gestalt concerning this invention.
[Drawing 2] It is the sectional side elevation of the equipment which made one the reader section 1 and the printer section 2 in this operation gestalt.
[Drawing 3] It is the block diagram showing the configuration of the reader section 1 of this operation gestalt.
[Drawing 4] It is the block diagram showing the detail configuration of the memory 116 of this operation gestalt.
[Drawing 5] It is the block diagram showing the configuration of the facsimile section 3 of this operation gestalt.
[Drawing 6] It is the flow chart which shows the processing which rewrites the control program in the reader section 1 in this operation gestalt.
[Drawing 7] It is the flow chart which shows actuation of the facsimile section 3 at the time of rewriting a control program in this operation gestalt.
[Drawing 8] It is the block diagram showing the configuration of the image processing system in the 2nd operation gestalt concerning this invention.
[Drawing 9] It is the block diagram showing the configuration of the reader section 51 in the 2nd operation gestalt.
[Drawing 10] It is the block diagram showing the configuration of the core section 60 in the 2nd operation gestalt.
[Drawing 11] It is the block diagram showing the detail configuration of the memory 156 in the 2nd operation gestalt.
[Drawing 12] It is drawing showing the memory configuration of the flash ROM 1561 in the 2nd operation gestalt.
[Drawing 13] It is the flow chart which shows the processing which rewrites the control program in the reader section 1 in the 2nd operation gestalt.
[Drawing 14] It is the flow chart which shows interrupt processing at the time of rewriting a control program in the 2nd operation gestalt.
[Description of Notations]
1 Reader Section
2 Printer Section
3 Facsimile Section
4 Hard Disk
11 External Device
111 Image-Processing Section
114 CPU
115 Control Unit
116 Memory
1161 Flash ROM
1162 EPROM

1163 RAM

[Translation done.]

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審査請求　未請求　請求項の数16　ＯＬ　（全 13 頁）

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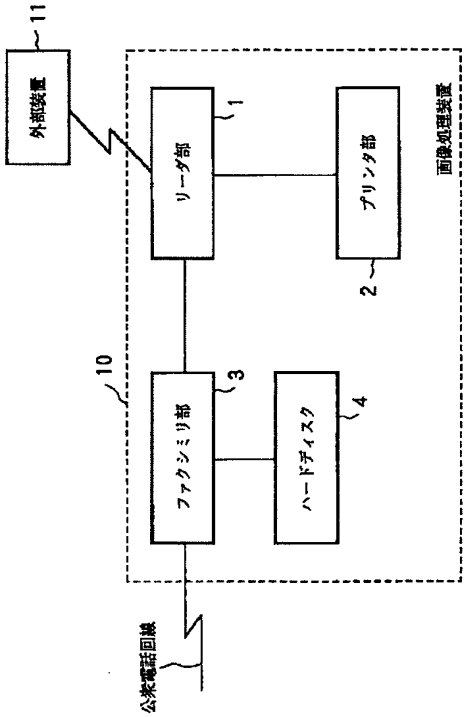
(54)【発明の名称】　画像処理装置及びその方法

(57)【要約】

【課題】　制御プログラムの書き換え動作中においても、何らかの画像処理を実行可能な画像処理装置及びその方法を提供することを目的とする。

【解決手段】　リーダ部１内のＣＰＵはファクシミリ部３における受信モジュールはリーダ部１の制御プログラムが書き換え中であっても動作可能であると判断し、実際の書き換え時にファクシミリ部３へ書き換え開始コマンドと共に動作可能モジュール情報を送信する。ファクシミリ部３では該情報に従って、リーダ部１の制御プログラムの書き換え中であっても、受信モジュールのみを通常動作させる。



【特許請求の範囲】
【請求項１】　制御プログラムを書き換え可能な記憶手段に保持した画像処理装置であって、
前記制御プログラムに従って装置全体を制御する制御手段と、
前記制御プログラムを書き換える書き換え手段とを有し、
前記制御手段は、前記書き換え手段による書き換えの際に動作可能な処理を指示し、前記書き換え手段による書き換えの際に該処理の動作を許可することを特徴とする画像処理装置。
【請求項２】　前記記憶手段はフラッシュＲＯＭを含むことを特徴とする請求項１記載の画像処理装置。
【請求項３】　前記記憶手段はＥＥＰＲＯＭを含むことを特徴とする請求項２記載の画像処理装置。
【請求項４】　前記書き換え手段による書き換えの際に動作可能な処理は、前記制御プログラムが直接関与しない処理であることを特徴とする請求項１記載の画像処理装置。
【請求項５】　更に、前記書き換え可能な記憶手段とは異なる第２の記憶手段に第２の制御プログラムを有し、
前記書き換え手段による書き換えの際に動作可能な処理は、前記第２の制御プログラムによる処理であることを特徴とする請求項４記載の画像処理装置。
【請求項６】　前記第２の記憶手段は書き換え不可能であることを特徴とする請求項５記載の画像処理装置。
【請求項７】　更に、操作者に装置状態を報知する報知手段を有し、
前記報知手段は、前記書き換え手段による書き換えの際に、書き換え中である旨を報知することを特徴とする請求項１記載の画像処理装置。
【請求項８】　前記報知手段は、前記書き換え手段による書き換えの際に、動作可能な処理を報知することを特徴とする請求項７記載の画像処理装置。
【請求項９】　制御プログラムを書き換え可能な記憶手段に保持した画像処理装置であって、
前記制御プログラムに従って装置全体を制御する制御手段と、
前記制御プログラムを書き換える書き換え手段とを有し、
前記記憶手段は前記制御プログラムを複数のモジュールに分割して保持し、
前記書き換え手段は前記モジュール単位で書き換えを行い、
前記制御手段は、前記書き換え手段による書き換えの際に動作可能な処理を前記複数のモジュールから指示し、
前記書き換え手段による書き換えの際に該モジュールの動作を許可することを特徴とする画像処理装置。
【請求項１０】　前記制御手段は、前記書き換え手段による書き換えの際に前記指示されたモジュールが動作する場合、前記書き換えを中断することを特徴とする請求項９記載の画像処理装置。
【請求項１１】　前記記憶手段はフラッシュＲＯＭを含むことを特徴とする請求項９記載の画像処理装置。
【請求項１２】　前記記憶手段はＥＥＰＲＯＭを含むことを特徴とする請求項１１記載の画像処理装置。
【請求項１３】　更に、操作者に装置状態を報知する報知手段を有し、
前記報知手段は、前記書き換え手段による書き換えの際に、書き換え中である旨を報知することを特徴とする請求項９記載の画像処理装置。
【請求項１４】　前記報知手段は、前記書き換え手段による書き換えの際に、動作可能な処理を報知することを特徴とする請求項１３記載の画像処理装置。
【請求項１５】　制御プログラムを書き換え可能な記憶手段に保持した画像処理装置における画像処理方法であって、
前記制御プログラムを書き換える際に動作可能な処理を指示し、書き換えの際に該処理の動作を許可することを特徴とする画像処理方法。
【請求項１６】　制御プログラムを書き換え可能な記憶手段に保持した画像処理装置における画像処理方法であって、
前記記憶手段は前記制御プログラムを複数のモジュールに分割して保持し、
前記制御プログラムを前記モジュール単位で書き換える際に動作可能な処理を前記複数のモジュールから指示し、書き換えの際に該モジュールの動作を許可することを特徴とする画像処理方法。
【発明の詳細な説明】
【０００１】
【発明の属する技術分野】本発明は画像処理装置及びその方法に関し、例えば、画像処理装置内に具備された制御プログラムの書き換えを行う画像処理装置及びその方法に関する。
【０００２】
【従来の技術】従来より、画像処理装置における制御プログラムを格納する不揮発性メモリとして、製造工程において固定データ（制御プログラム）を書き込んだマスクＲＯＭや、製造後にプログラムの書き込みが可能なＰＲＯＭ(programmable ROM)や紫外線消去型のＥＰＲＯＭ(erasable PROM)が使用されていた。近年、これらに代わるメモリとして、電気的に書き換え可能な不揮発性メモリであるＥＥＰＲＯＭ(electrically erasable and programmable ROM)等が開発され、画像処理装置においてもこれらを用いることが提案されている。このような書き換え可能な不揮発性メモリを用いることにより、制御プログラムの修正、変更の際にＲＯＭ交換を行う必要がなくなり、オンボード上で該プログラムの書き換えを行うことが容易に可能となった。これにより、ネットワー

クを介して接続された画像処理装置であれば、遠隔地から通信を用いて制御プログラムを書き換えることもできるようになった。

【０００３】

【発明が解決しようとする課題】しかしながら、上述した書き換え可能な不揮発性メモリに制御プログラムを格納した画像処理装置において、該制御プログラムの書き換えを行う場合には、該画像処理装置はその機能を全て停止しておく必要があった。即ち、メモリの書き換え動作中においては他の処理が行なえないため、処理効率が低下してしまうという問題があった。

【０００４】本発明は上述した課題を解決するためになされたものであり、制御プログラムの書き換え動作中においても、何らかの画像処理を実行可能な画像処理装置及びその方法を提供することを目的とする。

【０００５】

【課題を解決するための手段】上述した目的を達成するための一手段として、本発明の画像処理装置は以下の構成を備える。

【０００６】即ち、制御プログラムを書き換え可能な記憶手段に保持した画像処理装置であって、前記制御プログラムに従って装置全体を制御する制御手段と、前記制御プログラムを書き換える書き換え手段とを有し、前記制御手段は、前記書き換え手段による書き換えの際に動作可能な処理を指示し、前記書き換え手段による書き換えの際に該処理の動作を許可することを特徴とする。

【０００７】例えば、前記記憶手段はフラッシュＲＯＭを含むことを特徴とする。

【０００８】例えば、前記記憶手段はＥＥＰＲＯＭを含むことを特徴とする。

【０００９】例えば、前記書き換え手段による書き換えの際に動作可能な処理は、前記制御プログラムが直接関与しない処理であることを特徴とする。

【００１０】更に、前記書き換え可能な記憶手段とは異なる第２の記憶手段に第２の制御プログラムを有し、前記書き換え手段による書き換えの際に動作可能な処理は、前記第２の制御プログラムによる処理であることを特徴とする。

【００１１】例えば、前記第２の記憶手段は書き換え不可能であることを特徴とする。

【００１２】更に、操作者に装置状態を報知する報知手段を有し、前記報知手段は、前記書き換え手段による書き換えの際に、書き換え中である旨を報知することを特徴とする。

【００１３】例えば、前記報知手段は、前記書き換え手段による書き換えの際に、動作可能な処理を報知することを特徴とする。

【００１４】また、制御プログラムを書き換え可能な記憶手段に保持した画像処理装置であって、前記制御プログラムに従って装置全体を制御する制御手段と、前記制御プログラムを書き換える書き換え手段とを有し、前記記憶手段は前記制御プログラムを複数のモジュールに分割して保持し、前記書き換え手段は前記モジュール単位で書き換えを行い、前記制御手段は、前記書き換え手段による書き換えの際に動作可能な処理を前記複数のモジュールから指示し、前記書き換え手段による書き換えの際に該モジュールの動作を許可することを特徴とする。

【００１５】例えば、前記制御手段は、前記書き換え手段による書き換えの際に前記指示されたモジュールが動作する場合、前記書き換えを中断することを特徴とする。

【００１６】例えば、前記記憶手段はフラッシュＲＯＭを含むことを特徴とする。

【００１７】例えば、前記記憶手段はＥＥＰＲＯＭを含むことを特徴とする。

【００１８】更に、操作者に装置状態を報知する報知手段を有し、前記報知手段は、前記書き換え手段による書き換えの際に、書き換え中である旨を報知することを特徴とする。

【００１９】例えば、前記報知手段は、前記書き換え手段による書き換えの際に、動作可能な処理を報知することを特徴とする。

【００２０】上述した目的を達成するための一手法として、本発明の画像処理方法は以下の工程を備える。

【００２１】即ち、制御プログラムを書き換え可能な記憶手段に保持した画像処理装置における画像処理方法であって、前記制御プログラムを書き換える際に動作可能な処理を指示し、書き換えの際に該処理の動作を許可することを特徴とする。

【００２２】また、制御プログラムを書き換え可能な記憶手段に保持した画像処理装置における画像処理方法であって、前記記憶手段は前記制御プログラムを複数のモジュールに分割して保持し、前記制御プログラムを前記モジュール単位で書き換える際に動作可能な処理を前記複数のモジュールから指示し、書き換えの際に該モジュールの動作を許可することを特徴とする。

【００２３】

【発明の実施の形態】以下、本発明に係る一実施形態について、図面を参照して詳細に説明する。

【００２４】＜第１実施形態＞図１は本実施形態における画像処理装置の構成を示すブロック図である。図１において、１０は画像処理装置、１１はホストコンピュータ等の外部装置であり、所定のインタフェースにより互いに接続されている。また、画像処理装置１０において、１はリーダ部、２はプリンタ部、３はファクシミリ部、４はハードディスクである。

【００２５】以下、上記構成における動作について説明する。まず、リーダ部１は不図示の原稿台に載置された原稿の画像を光学的に読み取り、原稿画像に応じた画像データをプリンタ部２及びファクシミリ部３へ出力す

る。尚、本実施形態の画像処理装置１０において、後述するプログラムの書き換え対象となるメモリはリーダ部１内に備えられているものとする。プリンタ部２は、リーダ部１及びファクシミリ部３を介して入力された画像データに応じた画像を、記録媒体上に記録する。ファクシミリ部３はリーダ部１に接続されており、公衆電話回線を介して受信した圧縮画像データを伸長し、該伸長した画像データをリーダ部１へ転送する、所謂受信処理を行う、又、ファクシミリ部３は、リーダ部１から転送されてきた画像データを圧縮し、該圧縮した画像データを公衆電話回線を介して設定された相手先へ送信する。ファクシミリ部３にはハードディスク４が接続されており、受信した圧縮画像データを一時的に保存することができる。また、外部装置１１は例えばホストコンピュータであり、後述する様にしてリーダ部１内のメモリの書き換えを行う。

【００２６】以下、リーダ部１及びプリンタ部２について詳細に説明する。本実施形態においてはリーダ部１及びプリンタ部２を一体の装置として備えており、図２にその側断面図を示す。リーダ部１において、１０１は原稿給送装置であり、原稿を最終頁から順に１枚ずつプラテンガラス１０２上へ給送し、原稿の読み取り動作終了後、プラテンガラス１０２上の原稿を排出するものである。原稿がプラテンガラス１０２上に搬送されると、ランプ１０３が点灯し、スキャナユニット１０４の移動が開始されることにより、原稿が露光走査される。この時の原稿からの反射光は、ミラー１０５，１０６，１０７、及びレンズ１０８によってＣＣＤイメージセンサ（以下ＣＣＤと称する）１０９へ導かれる。このようにして、プラテンガラス１０２上で走査された原稿の画像データは、ＣＣＤ１０９によって読み取られる。ＣＣＤ１０９から出力される画像データは、所定の画像処理が施された後、プリンタ部２又はファクシミリ部３へ転送される。

【００２７】プリンタ部２において、２２１はレーザドライバであり、レーザ発光部２０１を駆動して、リーダ部１から出力された画像データに応じたレーザ光を発光させる。該レーザ光は感光ドラム２０２に照射され、感光ドラム２０２にはレーザ光に応じた潜像が処理される。この感光ドラム２０２の潜像の部分には現像器２０３によって現像剤が付着される。そして、レーザ光の照射開始と同期したタイミングで、カセット２０４及びカセット２０５のいずれかから記録紙を給紙して転写部２０６へ搬送し、感光ドラム２０２に付着された現像剤を該記録紙に転写する。現像剤ののった記録紙は定着部２０７に搬送され、加熱及び加圧されることにより、現像剤が記録紙に定着される。定着部２０７を通過した記録紙は排出ローラ２０８によって排出される。ソータ２２０は排出された記録紙をそれぞれのビンに収納することにより、記録紙の仕分けを行う。尚、ソータ２２０における仕分けが設定されていない場合には、最上ビンに記録紙を収納する。また、両面記録が設定されている場合には、排出ローラ２０８まで記録紙を搬送した後、排出ローラ２０８の回転方向を逆転させ、フラッパ２０９によって再給紙搬送路へ記録紙を導く。また、多重記録が設定されている場合には、記録紙を排出ローラ２０８まで搬送しないように、フラッパ２０９によって再給紙搬送路へ導く。再給紙搬送路へ導かれた記録紙は、上述したタイミングで転写部２０６へ給紙される。

【００２８】図３に、リーダ部１の詳細ブロック構成を示す。図３において、１０９はＣＣＤ、１１０はＡ／Ｄ変換及びシェーディング補正を行うＡ／Ｄ・ＳＨ部、１１１は各種画像処理を行う画像処理部、１１３はファクシミリ部３とのインタフェースを司るＩ／Ｆ部、１１５は操作者により指示入力や、装置の状態報知等が行われる操作部、１１７は外部装置１１とのインタフェースを司るＩ／Ｆ部であり、ＳＣＳＩ，ＲＳ－２３２Ｃ等を備えている。

【００２９】１１４はリーダ部１の各構成を統括的に制御するＣＰＵであり、１１６はＣＰＵ１１４によって参照、実行される制御プログラムを格納したメモリである。メモリ１１６はＥＥＰＲＯＭ等によって構成され、本実施形態において書き換え対象となるメモリである。

【００３０】ＣＣＤ１０９から出力された画像データは、Ａ／Ｄ・ＳＨ部１１０でアナログ／デジタル変換が行われるとともに、シェーディング補正が行われる。Ａ／Ｄ・ＳＨ部１１０によって処理された画像データは画像処理部１１１を介してプリンタ部２へ転送されるとともに、Ｉ／Ｆ部１１３を介してファクシミリ部３へ転送される。ＣＰＵ１１４は操作部１１５で設定された設定内容に応じて、画像処理部１１１及びＩ／Ｆ部１１３を制御する。例えば、操作部１１５でトリミング処理を行って複写を行う複写モードが設定されている場合には、画像処理部１１１でトリミング処理を行わせてからプリンタ部２へ転送させる。また、操作部１１５でファクシミリ送信モードが設定されている場合には、画像データ及び設定されたモードに応じた制御コマンドを、Ｉ／Ｆ部１１３からファクシミリ部３へ転送させる。上述した様に、このような処理を行うＣＰＵ１１４の制御プログラムはメモリ１１６に記憶されている。また、メモリ１１６はＣＰＵ１１４の作業領域としても使用される。

【００３１】次に、メモリ１１６の詳細構成について説明する。図４は、図３に示すメモリ１１６の構成を示すブロック図である。図４において、メモリ１１６はフラッシュＲＯＭ１１６１，ＥＰＲＯＭ１１６２，ＲＡＭ１１６３により構成されている。また、１１８及び１１９はそれぞれＣＰＵ１１４のアドレスバス及びデータバスである。フラッシュＲＯＭ１１６１はリーダ部１の通常動作のための制御プログラムを記憶しており、ＥＥＰＲＯＭ等からなる書き換え可能な不揮発性メモリである。

ＥＰＲＯＭ１１６２はフラッシュＲＯＭ１１６１を書き換える際のダウンロードプログラムを記憶している。また、ＲＡＭ１１６３はリーダ部１のバックアップデータの記憶、及びＣＰＵ１１４の作業領域として使用される。

【００３２】以下、上述した様な構成の画像処理装置１０において、例えば外部装置１１によりリーダ部１の制御プログラムを書き換える、所謂バージョンアップ処理を行う場合の動作について考える。この時、外部装置１１はホストコンピュータであり、ＲＳ－２３２Ｃのインタフェース１１７を介して図４に示すフラッシュＲＯＭ１１６１内に記憶する制御プログラムを画像処理装置１０側に送信する。するとＣＰＵ１１４は、ＥＰＲＯＭ１１６２に記憶されたダウンロードプログラムを参照しながら、受信した制御プログラムをフラッシュＲＯＭ１１６１に記憶させる。

【００３３】この場合、フラッシュＲＯＭ１１６１は書き換えモードになっており、通常の読み出し動作はできない。従って、リーダ部１では通常動作が行なえない状態になる。そこで本実施形態においては、フラッシュＲＯＭ１１６１の書き換えを行う際には、プリンタ部２およびファクシミリ部３にその旨を通知する。そして、プリンタ部２及びファクシミリ部３において、リーダ部１が動作していなければ動作することができないモジュールに関してはその動作を全て中止し、リーダ部１が動作していなくても動作可能なモジュールに関してはそのまま動作を続行する。例えば本実施形態においては、ファクシミリ部３において公衆電話回線を介して受信した圧縮画像データをハードディスク４に保存する機能のみが、リーダ部１の状態に関らず動作可能であるとする。

【００３４】ここで、ファクシミリ部３の詳細構成を、図５のブロック図に示す。図５において、３１はファクシミリ部３の動作を制御するＣＰＵであり、３２はファクシミリ部３における制御プログラムを保持するメモリである。メモリ３２は書き換え不可能な不揮発性メモリ（マスクＲＯＭ等）であり、受信モジュール及び送信モジュールを制御プログラムとして備えている。３３，３５はそれぞれ通信相手装置，リーダ部１とのインタフェースをとるＩ／Ｆ部であり、３４は受信画像の伸張処理や送信画像の圧縮処理等を行う画像処理部である。尚、ファクシミリ部３においてＩ／Ｆ３３を介して受信された画像データは、画像処理部３４で伸張され、ハードディスク４に格納される。

【００３５】以下、図６に示すフローチャートを参照して、本実施形態のメモリ書き換え実行時におけるリーダ部１の動作の詳細について説明する。図６のフローチャートに示す処理はリーダ部１のフラッシュＲＯＭ１１６１のダウンロードを行う際の処理を示し、該処理を実現するプログラムは、ＥＰＲＯＭ１１６２にダウンロードプログラムとして予め記憶されている。該ダウンロードプログラムは外部装置１１から書き換え実行のコマンドを受信することにより起動され、ＣＰＵ１１４によって実行される。

【００３６】リーダ部１が外部装置１１のホストコンピュータより書き換え実行のコマンドを受信すると、まずステップＳ１０１において制御プログラムが書き換え可能であるか否かが判定され、書き換え不可能であればステップＳ１０１に戻り、書き換え可能になるのを待つ。ここで、書き換え不可能である状態としては、画像処理装置１０が現在複写処理やファクシミリ送信／受信処理等の動作中であるか、又は、紙詰まりや紙無し等の中間状態であるか、又は、ヒートローラの異常加熱等の何らかの異常状態である場合が考えられる。

【００３７】ステップＳ１０１で制御プログラムが書き換え可能であればステップＳ１０２に進み、ＣＰＵ１１４はプリンタ部２、ファクシミリ部３に対して、制御プログラムの書き換えが開始されたことを示す書き換え開始コマンドを送信する。この時ＣＰＵ１１４は、制御プログラムの書き換え中であっても動作可能な機能の情報を、送信する書き換え開始コマンドに機能情報として付加する。

【００３８】リーダ部１においては、メモリ１１６内にファクシミリ部３で動作するモジュールの一覧を備えている。即ち、ファクシミリ部３における受信モジュールと送信モジュールに関する情報を有している。尚、ＣＰＵ１１４が、例えばファクシミリ部３のＣＰＵ３１に対して、メモリ３２内のモジュールの問い合わせを行うようにしても良い。

【００３９】このように、ステップＳ１０２において書き換え開始コマンドを送信する際に、ファクシミリ部３で動作可能なモジュールを判定することができる。例えば、メモリ１１６内の動作モジュール一覧内に、書き換え時に動作可能か否かを示すフラグ等を設けておけば良い。ファクシミリ部３における受信モジュールにおいては、受信した信号をハードディスク４に格納するため、これはリーダ部１内のメモリ１１６が書き換え中であっても動作可能であるが、送信モジュールではリーダ部１が送信信号を生成する必要があるため、書き換え中には動作不可能である。

【００４０】そしてステップＳ１０３に進み、ＣＰＵ１１４は書き換え実行中の動作状態を操作部１１５に表示する。本実施形態においては、書き換え実行中である旨の表示と、ファクシミリの自動受信が可能である旨の表示を行う。

【００４１】続いてステップＳ１０４に進み、フラッシュＲＯＭ１１６１に対して制御プログラムの書き換えを実行する。この時、ステップＳ１０２で書き換え開始コマンドに付加された機能情報で示される機能（ファクシミリ部３における受信モジュール）のみが動作可能である。即ち、書き換え実行中にはファクシミリ部３におい

て電話回線を介して受信した圧縮画像データをハードディスク４に保存することが可能である。

【００４２】フラッシュＲＯＭ１１６１の書き換えが終了するとステップＳ１０５に進み、ＣＰＵ１１４はプリンタ部２、ファクシミリ部３に制御プログラムの書き換えが終了したことを示す書き換え終了コマンドを送信する。

【００４３】続いてステップＳ１０６に進み、ＣＰＵ１１４は操作部１１５に、通常動作が可能である旨の表示を行い、その後、通常動作に戻る。例えば本実施形態においては、書き換え実行中にファクシミリ部３において受信処理が行われたのであれば、ハードディスク４に格納されている受信データをプリンタ部２から出力する。

【００４４】尚、制御プログラムの書き換えによって画像処理装置１０の機能が大きく変わってしまう場合には、画像処理装置１０の本体電源を一旦オフにした後、再びオンとすることによりリブートをかけても良い。この場合、ステップＳ１０６において操作部１１５にその旨の表示を行い、操作者にリブートを促す。

【００４５】次に、図７に示すフローチャートを参照して、メモリ書き換え実行時におけるファクシミリ部３の動作について詳細に説明する。

【００４６】図７のフローチャートに示す処理はリーダ部１のフラッシュＲＯＭ１１６１のダウンロードを行う際のファクリミリ部３における処理を示す。該処理を実現するプログラムは、ファクシミリ部３内の不図示のＲＯＭ等に保持されており、ＣＰＵ１１４から書き換え開始コマンドを受信することにより起動される。

【００４７】ファクシミリ部３がリーダ部１より書き換え開始コマンドを受信するとまずステップＳ２０１において、受信した書き換え開始コマンドに付加されている機能情報から、ファクシミリ部３において動作可能なモジュール（受信モジュール）が選択される。次にステップＳ２０２に進み、ファクシミリ部３は動作可能なモジュールのみを実行可能な状態にする。そしてステップＳ２０３に進み、リーダ部１から書き換え終了コマンドを受信したか否かを判定する。受信していなければステップＳ２０２に戻り、書き換え終了コマンドを受信するまで、ステップＳ２０２における動作可能なモジュールのみの動作を続行する。ステップＳ２０３において書き換え終了コマンドを受信したらステップＳ２０４に進み、通常の動作に復帰する。

【００４８】尚、本実施形態においては、制御プログラムの書き換え中に動作可能なモジュールとして、ファクリミリ部３における受信モジュールのみであるとして説明を行ったが、リーダ部１による直接の制御を必要としない機能であれば、ファクシミリ部３に限らず本発明が適用可能である。

【００４９】以上説明した様に本実施形態によれば、画像処理装置の制御プログラムの書き換え中であっても、該制御プログラムの動作に関らず動作可能な機能に関してはそのまま動作を続行することができる。従って、画像処理装置を効率良く稼働させながら、適宜バージョンアップを行うことができる。

【００５０】＜第２実施形態＞以下、本発明に係る第２実施形態について説明する。

【００５１】図８は、第２実施形態における画像処理装置の構成を示すブロック図である。図８において、５１はリーダ部であり、不図示の原稿台に載置された原稿画像を読み取り、該原稿画像に応じた画像データをプリンタ部５２及び画像入出力制御部５３へ出力する。プリンタ部５２はリーダ部５１及び画像入出力制御部５３から転送されてくる画像データに応じた画像を、記録紙上に記録して出力する。画像入出力制御部５３はリーダ部５１に接続されており、ファクシミリ部５４，ファイル部５５，コンピュータインターフェース部５７，フォーマッタ部５８，イメージメモリ部５９，コア部６０等からなる。

【００５２】ファクシミリ部５４は、公衆電話回線を介して受信した圧縮画像データを伸長し、該伸長された画像データをコア部６０へ転送する。又、コア部６０から転送されてき画像データを圧縮し、該圧縮された画像データを公衆電話回線を介して指定された宛て先へ送信する。ファクシミリ部５４にはハードディスク６２が接続されており、受信した圧縮画像データを一時的に保存することができる。

【００５３】ファイル部５５には光磁気ディスクドライブユニット５６が接続されている。ファイル部５５はコア部６０から転送されてきた画像データを圧縮し、光磁気ディスクドライブユニット５６にセットされた着脱可能な光磁気ディスクに、該画像データを検索するためのキーワードとともに記憶させる。又、ファイル部５５はコア部６０を介して転送されてきたキーワードに基づいて、光磁気ディスクに記憶されている圧縮画像データを検索する。そして、検索された圧縮画像データを読み出して伸長し、該伸長された画像データをコア部６０へ転送する。

【００５４】コンピュータインターフェース部５７は、パーソナルコンピュータ又はワークステーション（ＰＣ／ＷＳ）６１とコア部６０の間のインターフェースを司る部分である。フォーマッタ部５８はＰＣ／ＷＳ６１から転送されてきた、画像を表現すりコードデータをプリンタ部５２で記録可能な形式の画像データに展開するものである。イメージメモリ部５９はＰＣ／ＷＳ６１から転送されてきたデータを一時的に記憶するものである。

【００５５】尚、コア部６０の詳細については後述するが、コア部６０はリーダ部５１，ファクシミリ部５４，ファイル部５５，コンピュータインターフェース部５７，フォーマッタ部５８，イメージメモリ部５９のそれぞれの間のデータの流れを制御するものである。また、

第２実施形態においては、外部装置６３をホストコンピュータとして、リーダ部５１内のメモリの書き換えを行うものとする。

【００５６】尚、第２実施形態においてはリーダ部１及びプリンタ部２を一体の装置として備えるが、その側断面図は上述した第１実施形態に示す図２と同様であるため、説明を省略する。

【００５７】図９に、リーダ部５１の詳細ブロック構成を示す。図９において、１５９はＣＣＤ、１５０はＡ／Ｄ変換及びシェーディング補正を行うＡ／Ｄ・ＳＨ部、１５１は各種画像処理を行う画像処理部、１５３は画像入出力制御部５３とのインタフェースを司るＩ／Ｆ部、１５５は操作者により指示入力や、装置の状態報知等が行われる操作部、１５７は外部装置１１とのインタフェースを司るＩ／Ｆ部であり、ＳＣＳＩ，ＲＳ－２３２Ｃ等を備えている。

【００５８】１５４はリーダ部５１の各構成を統括的に制御するＣＰＵであり、１５６はＣＰＵ１５４によって参照、実行される制御プログラムを格納したメモリである。メモリ１５６はＥＥＰＲＯＭ等によって構成され、本実施形態において書き換え対象となるメモリである。

【００５９】ＣＣＤ１５９から出力された画像データは、Ａ／Ｄ・ＳＨ部１５０でアナログ／デジタル変換が行われるとともに、シェーディング補正が行われる。Ａ／Ｄ・ＳＨ部１５０によって処理された画像データは画像処理部１５１を介してプリンタ部２へ転送されるとともに、Ｉ／Ｆ部１５３を介して画像入出力制御部５３のコア部６０へ転送される。ＣＰＵ１５４は操作部１５５で設定された設定内容に応じて、画像処理部１５１及びＩ／Ｆ部１５３を制御する。例えば、操作部１５５でトリミング処理を行って複写を行う複写モードが設定されている場合には、画像処理部１５１でトリミング処理を行わせてからプリンタ部２へ転送させる。また、操作部１５５でファクシミリ送信モードが設定されている場合には、画像データ及び設定されたモードに応じた制御コマンドを、Ｉ／Ｆ部１５３からコア部６０へ転送させる。上述した様に、このような処理を行うＣＰＵ１５４の制御プログラムはメモリ１５６に記憶されている。また、メモリ１５６はＣＰＵ１５４の作業領域としても使用される。

【００６０】図１０に、コア部６０の詳細ブロック構成を示す。コア部６０内において、１２０が画像入出力制御部５３における他の構成とのインタフェースをとるＩ／Ｆ部、１２１は画像処理を行うデータ処理部、１２２はリーダ部５１とのインタフェースをとるＩ／Ｆ部、１２３はコア部６０全体の制御を行うＣＰＵ、１２４はＣＰＵ１２３によって実行される制御プログラムを格納したメモリである。

【００６１】リーダ部５１から転送されてきた画像データ及び制御コマンドは、それぞれデータ処理部１２１及びＣＰＵ１２３へ入力される。転送されてきた画像データは、データ処理部１２１で回転や変倍等の画像処理が施され、制御コマンドの内容に応じて、Ｉ／Ｆ部１２０を介してファクシミリ部５４，ファイル部５５，コンピュータインターフェース部５７のいずれかへ転送される。

【００６２】また、コンピュータインターフェース５７を介して入力される、画像を表すコードデータは、データ処理部１２１に転送された後にフォーマッタ部５８へ転送される。そしてフォーマッタ部５８で画像データに展開された後、該画像データはデータ処理部１２１に転送され、ファクシミリ部５４やプリンタ部５２へ転送される。

【００６３】ファクシミリ部５４からの画像データは、データ処理部１２１へ転送された後、プリンタ部５２やファイル部５５，コンピュータインターフェース部５７のいずれかへ転送される。また、ファイル部５５からの画像データは、データ処理部１２１へ転送された後、プリンタ部５２やファクシミリ部５４，コンピュータインターフェース部５７へ転送される。

【００６４】ＣＰＵ１２３は、メモリ１２４に記憶されている制御プログラム、及びリーダ部５１から転送されてくる制御コマンドに従って、上述したような制御を行う。尚、メモリ１２４はＣＰＵ１２３の作業領域としても使用される。

【００６５】以上説明した様に第２実施形態の画像処理装置においては、コア部６０を中心に、原稿画像の読み取り、画像のプリント、画像の送受信、画像の保存、コンピュータからのデータの入出力等の機能を複合させた処理を行うことが可能である。

【００６６】次に、リーダ部５１内のメモリ１５６の詳細構成について説明する。図１１は、図９に示すメモリ１５６の構成を示すブロック図である。図１１において、メモリ１５６はフラッシュＲＯＭ１５６１及びＲＡＭ１５６２により構成されている。また、１５８及び１５９はそれぞれＣＰＵ１５４のアドレスバス及びデータバスである。フラッシュＲＯＭ１５６１はリーダ部５１の通常動作のための制御プログラムを記憶しており、ＥＥＰＲＯＭ等の書き換え可能な不揮発性メモリである。また、ＲＡＭ１５６３はリーダ部５１のバックアップデータの記憶、及びＣＰＵ１５４の作業領域として使用される。

【００６７】ここで図１２に、フラッシュＲＯＭ１５６１の内部構成を示す。図１２に示す様に、フラッシュＲＯＭ１５６１は１１００～１１１５で示す１６ブロックに分割され、各ブロック毎に個別のモジュールが格納されている。フラッシュＲＯＭ１５６１は、書き換えを行う際に通常の読み出し動作ができない書き換えモードとなるが、書き換えを一時中断することで、読み出し動作が可能となる。また、フラッシュＲＯＭ１５６１は書き

換えを該ブロック単位で行うことができる。

【００６８】図１２に示すフラッシュＲＯＭ１５６１において、ブロック１１００にはフラッシュＲＯＭ１５６１を書き換える際にＣＰＵ１５４によって参照されるダウンロードプログラムが記憶されており、このブロックのみ、書き換えを禁止するためにハード的にプロテクトがかけられている。他のブロックに対して書き換えを行う際には、ＣＰＵ１５４はブロック１１００に記憶されたダウンロードプログラムをＲＡＭ１５６２に転送し、該転送されたプログラムを参照しながら制御を行う。また、ブロック１１０１からブロック１１０７まではリーダ部５１に関する制御プログラムを記憶している。また、ブロック１１０８からブロック１１１２までは各操作部のプログラムを記憶しており、ブロック１１１３からブロック１１１５は予備領域とする。

【００６９】以下、上述した様な構成をなす第２実施形態の画像処理装置において、例えば外部装置６３によりリーダ部５１の制御プログラムを書き換える、所謂バージョンアップ処理を行う場合の動作について考える。この時、外部装置６３はホストコンピュータであり、ＲＳ－２３２Ｃのインタフェース１５７を介して図１１に示すフラッシュＲＯＭ１５６１内に記憶する制御プログラムを画像処理装置側に送信する。するとＣＰＵ１５４は、ＲＡＭ１５６２に転送されたダウンロードプログラムを参照しながら、受信した制御プログラムをフラッシュＲＯＭ１５６１に記憶させる。

【００７０】第２実施形態におけるフラッシュＲＯＭ１５６１は、書き換えモード時は通常の読み出しができなくなるが、書き換えを一時中断することで読み出しが可能となる。そこで第２実施形態においては、フラッシュＲＯＭ１５６１の書き換えを行う際に以下のような制御を行う。

【００７１】即ち、書き換えるブロックと無関係なブロック内のプログラムを組み合わせて実行できるモジュールに関しては、読み出し可能とする。そして、書き換えモード時に実行可能なモジュールに対して実行命令が発生した場合には、書き換えを一時中断して実行可能なモジュールに対する動作を優先的に行い、該動作が終了した後、再度書き換えを行う。例えば、フラッシュＲＯＭ１５６１内の制御プログラムに対して、特に図１２のブロック１１１１に示すファイル操作部における機能を追加するための書き換えが行われる場合について考えると、この場合、コピー，ファクシミリ，プリンタの各操作部（それぞれブロック１１０９，１１１０，１１１２に対応）に関しては、通常の処理を行うことが許可される。

【００７２】次に、図１３に示すフローチャートを参照して、メモリ書き換え実行時におけるリーダ部５１の動作について詳細に説明する。図１３のフローチャートに示す処理はリーダ部５１のフラッシュＲＯＭ１５６１のダウンロードを行う際の処理を示し、該処理を実現するプログラムは、フラッシュＲＯＭ１５６１のブロック１１００に予め記憶されている。該ダウンロードプログラムは外部装置１１から書き換え実行のコマンドを受信することによりＲＡＭ１５６２に転送され、ＣＰＵ１５４によって実行される。

【００７３】リーダ部５１が外部装置１１のホストコンピュータより書き換え実行のコマンドを受信すると、まずステップＳ３０１において制御プログラムが書き換え可能であるか否かが判定され、書き換え不可能であればステップＳ３０１に戻り、書き換え可能になるのを待つ。ここで、書き換え不可能である状態としては、画像処理装置１０が現在複写処理やファクシミリ送信／受信処理等の動作中であるか、又は、紙詰まりや紙無し等の中間状態であるか、又は、ヒートローラの異常加熱等の何らかの異常状態である場合が考えられる。

【００７４】ステップＳ３０１で制御プログラムが書き換え可能であればステップＳ３０２に進み、ＣＰＵ１５４は書き換え対象であるブロック内のモジュールに関する機能を全て休止させる。例えば、上述した様にブロック１１１１に示すファイル操作モジュールに対する書き換えが行われる場合、ＣＰＵ１５４はこれよりファイル操作が不可能となる旨を操作部１５５に表示し、画像入出力制御部５３へファイル部５５が無効であることを示すコマンドを発行する。尚、この時、操作部１５５において、ファイル操作に関する表示を全て停止しても良い。

【００７５】次にステップＳ３０３に進み、画像処理装置は書き換えモードに移行する。そしてステップＳ３０４において、フラッシュＲＯＭ１５６１に対して制御プログラム（この場合ブロック１１１１のみ）の書き換えを実行する。

【００７６】そしてフラッシュＲＯＭ１５６１の書き換えが終了するとステップＳ３０５に進み、書き換えモードを終了する。続いてステップＳ３０６において、ステップＳ３０２で書き換えのために休止させたモジュールを再起動する。

【００７７】以上説明した様にして第２実施形態におけるメモリ書き換え処理が実行されるが、第２実施形態においては、上述した様にメモリ書き換え中においても他の操作を優先して実行することを特徴とする。以下、書き換え処理中の割込み中断処理について、図１４のフローチャートを参照して説明する。

【００７８】上述した図１３のステップＳ３０４に示す書き換え処理実行中において、何らかの動作可能モジュールに対する実行要求の割込みを受けたとする。例えば、図１２に示すブロック１１１２のプリンタ操作部内のモジュールに対するプリント実行命令等が、この割込み要求に該当する。するとＣＰＵ１５４は割込み中断処理を開始する。まずステップＳ３１１において、ＣＰＵ

１５４はフラッシュＲＯＭ１５６１のブロック１１１１に対する書き換えを一時中断し、フラッシュＲＯＭ１５６１を読み出し可能な状態にする。

【００７９】次に、ステップＳ３１２に進み、動作要求があった動作可能モジュールを実行する。そして該モジュールの動作が終了したらステップＳ３１３に進み、他の動作可能モジュールに対する動作要求割り込みが有るか否かを判定する。他のモジュールに対する割込みがあった場合、処理はステップＳ３１２に戻って当該モジュールを実行する。

【００８０】一方、ステップＳ３１３において他の割込みがなければステップＳ３１４に進み、ステップＳ３１１による書き換え処理の一時中断を解除しフラッシュＲＯＭ１５６１を書き換え可能な状態にする。

【００８１】そして、図１３に示すステップＳ３０４に戻り、書き換え処理を再開することができる。

【００８２】以上説明した様に第２実施形態によれば、画像処理装置の制御プログラムの書き換え中であっても、優先度の高い処理については、書き換え処理を中断して該処理を実行し、その終了後に書き換え処理を再実行することができる。従って、画像処理装置を効率良く稼働させながら、適宜バージョンアップを行うことができる。

【００８３】また、本発明は、ホストコンピュータ、インタフェース、プリンタ等の複数の機器から構成されるシステムに適用しても、複写機等の１つの機器からなる装置に適用しても良い。また、本発明はシステム或は装置にプログラムを供給することによって実施される場合にも適用できることは言うまでもない。この場合、本発明に係るプログラムを格納した記憶媒体が本発明を構成することになる。そして、該記憶媒体からそのプログラムをシステム或は装置に読み出すことによって、そのシステム或は装置が、予め定められた仕方で動作する。

【００８４】

【発明の効果】以上説明した様に本発明によれば、画像処理装置の制御プログラムの書き換え中であっても、該制御プログラムの動作に関らず動作可能な機能に関してはそのまま動作を続行することができる。

【００８５】また、制御プログラムの書き換え中であっても、優先度の高い処理については、書き換え処理を中断して該処理を実行し、その終了後に書き換え処理を再実行することができる。

【００８６】従って、本発明によれば、画像処理装置を効率良く稼働させながら、適宜バージョンアップを行うことができる。

【００８７】

【図面の簡単な説明】

【図１】本発明に係る一実施形態における画像処理装置の構成を示すブロック図である。

【図２】本実施形態におけるリーダ部１及びプリンタ部２を一体とした装置の側断面図である。

【図３】本実施形態のリーダ部１の構成を示すブロック図である。

【図４】本実施形態のメモリ１１６の詳細構成を示すブロック図である。

【図５】本実施形態のファクシミリ部３の構成を示すブロック図である。

【図６】本実施形態においてリーダ部１内の制御プログラムを書き換える処理を示すフローチャートである。

【図７】本実施形態において制御プログラムを書き換える際のファクシミリ部３の動作を示すフローチャートである。

【図８】本発明に係る第２実施形態における画像処理装置の構成を示すブロック図である。

【図９】第２実施形態におけるリーダ部５１の構成を示すブロック図である。

【図１０】第２実施形態におけるコア部６０の構成を示すブロック図である。

【図１１】第２実施形態におけるメモリ１５６の詳細構成を示すブロック図である。

【図１２】第２実施形態におけるフラッシュＲＯＭ１５６１のメモリ構成を示す図である。

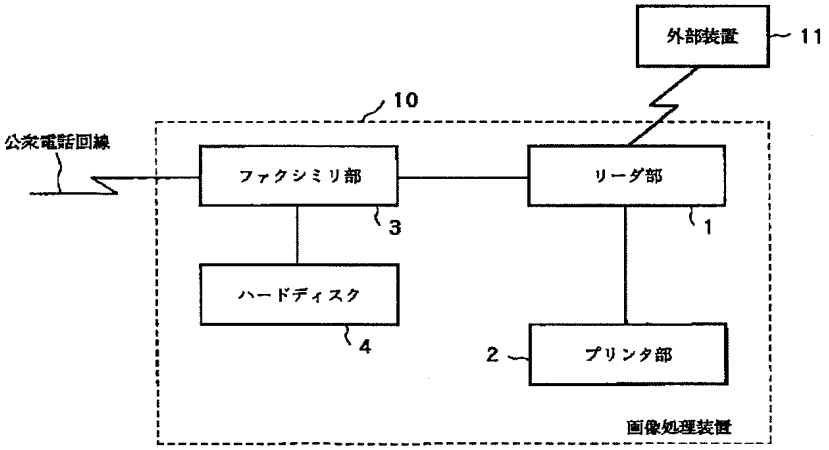
【図１３】第２実施形態においてリーダ部１内の制御プログラムを書き換える処理を示すフローチャートである。

【図１４】第２実施形態において制御プログラムを書き換える際の割込み処理を示すフローチャートである。

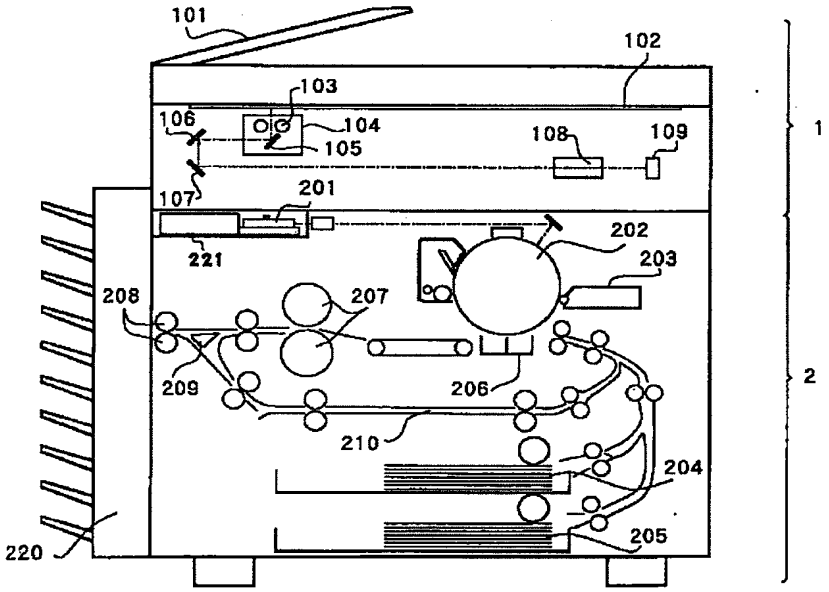
【符号の説明】

１　リーダ部
２　プリンタ部
３　ファクシミリ部
４　ハードディスク
１１　外部装置
１１１　画像処理部
１１４　ＣＰＵ
１１５　操作部
１１６　メモリ
１１６１　フラッシュＲＯＭ
１１６２　ＥＰＲＯＭ
１１６３　ＲＡＭ

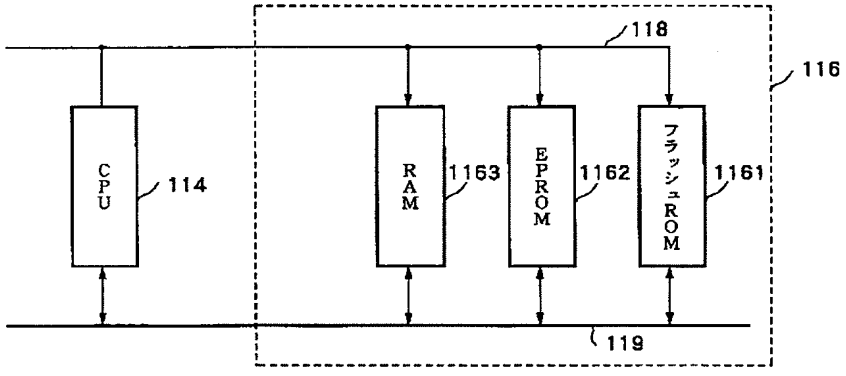
【図１】


外部装置
11
10
公衆電話回線
ファクシミリ部
3
リーダ部
1
ハードディスク
4
2
プリンタ部
画像処理装置

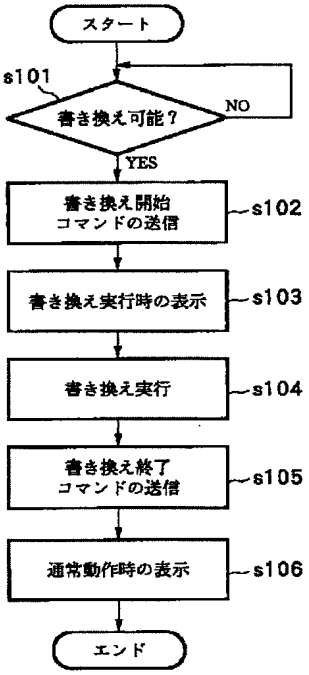
【図２】


101
102
103
106
104
105
108
109
107
201
221
202
203
208
207
209
206
210
204
205
220
1
2

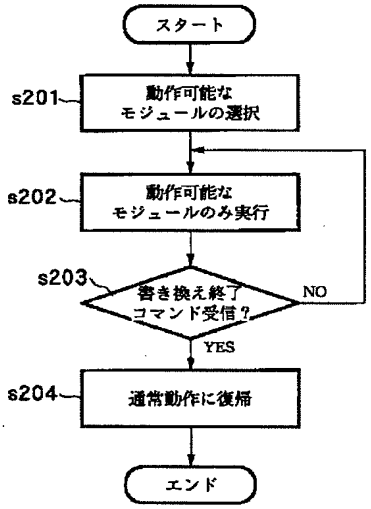
【図４】


118
116
CPU
114
RAM
1163
EPROM
1162
フラッシュROM
1161
119

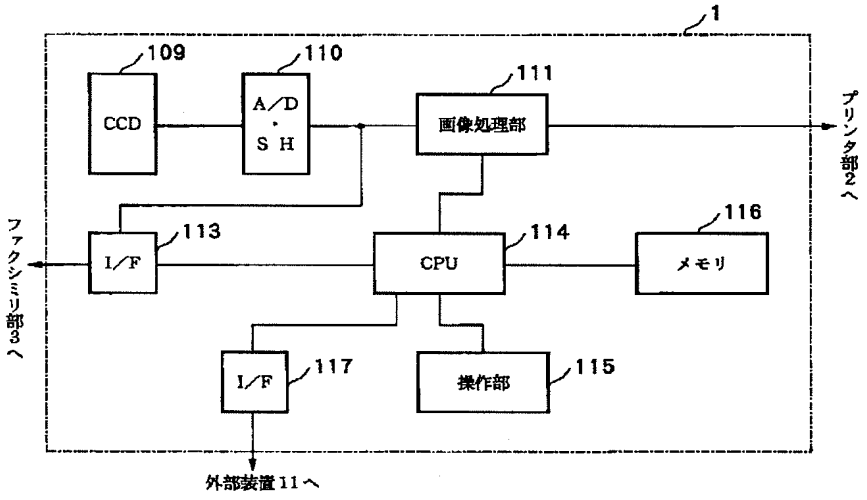
【図６】


スタート
s101
書き換え可能？
NO
YES
書き換え開始コマンドの送信
s102
書き換え実行時の表示
s103
書き換え実行
s104
書き換え終了コマンドの送信
s105
通常動作時の表示
s106
エンド

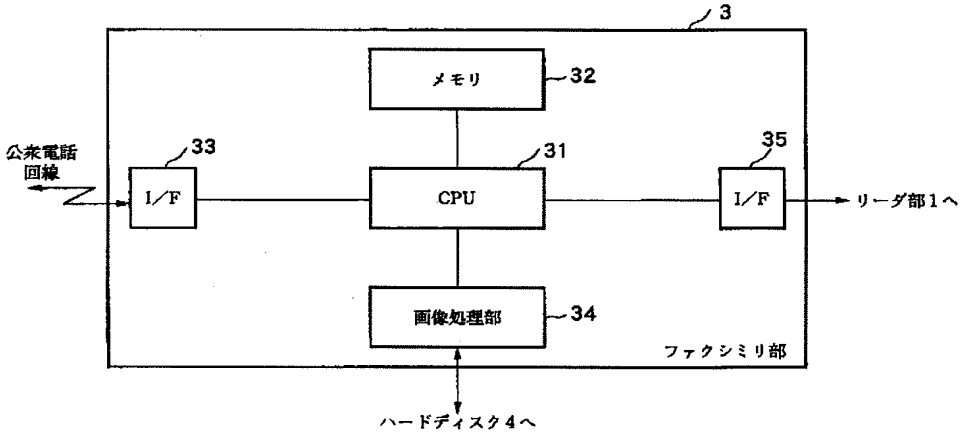
【図７】


スタート
s201
動作可能なモジュールの選択
s202
動作可能なモジュールのみ実行
s203
書き換え終了コマンド受信？
NO
YES
s204
通常動作に復帰
エンド

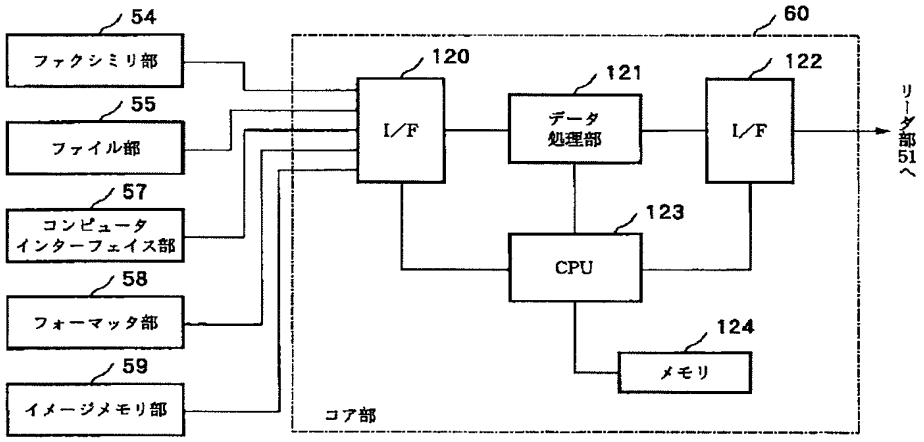
【図３】



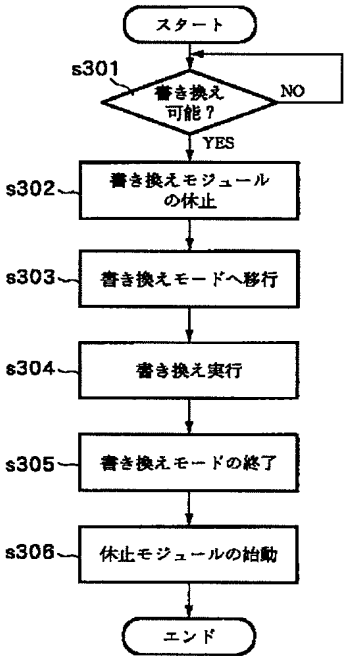
【図５】



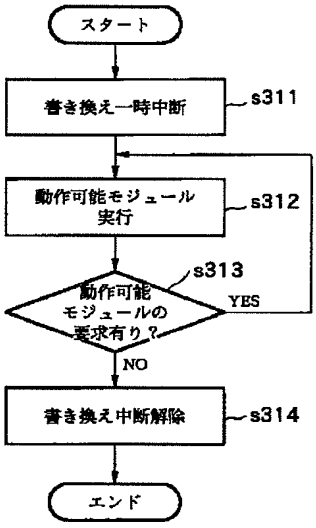
【図１０】



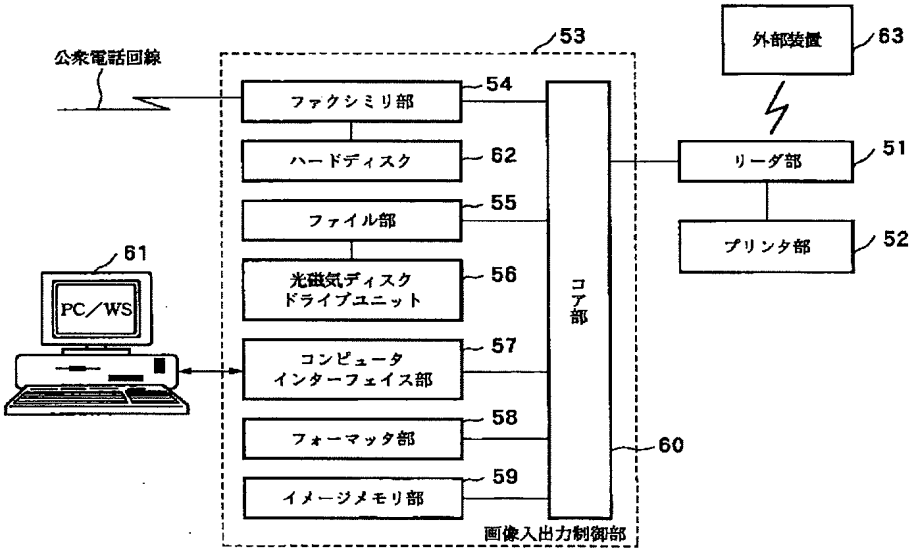
【図１３】



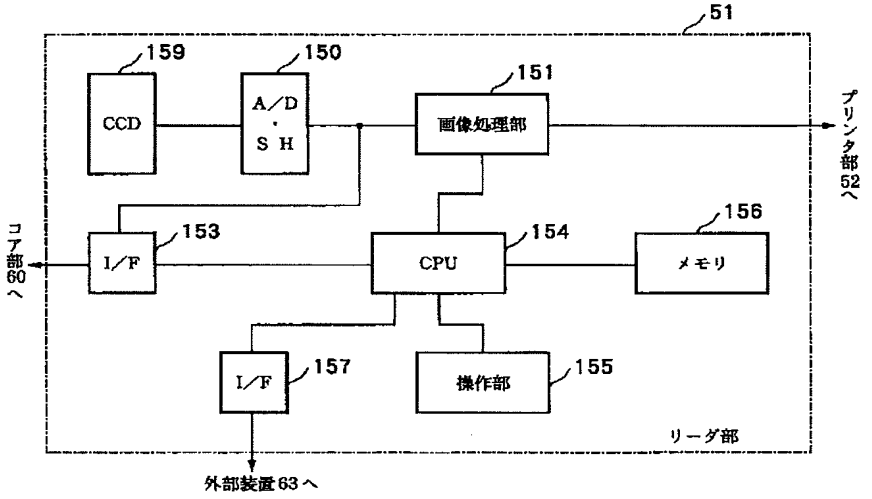
【図１４】



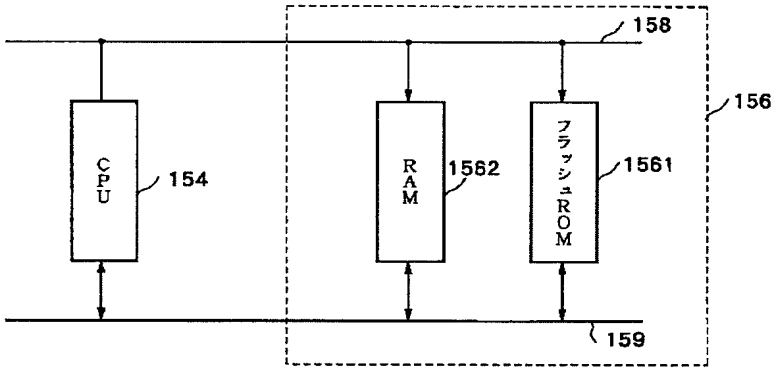
【図８】


公衆電話回線
53
外部装置
63
ファクシミリ部
54
ハードディスク
62
ファイル部
55
光磁気ディスク
ドライブユニット
56
コンピュータ
インターフェイス部
57
フォーマッタ部
58
イメージメモリ部
59
コア部
60
リーダ部
51
プリンタ部
52
61
PC／WS
画像入出力制御部

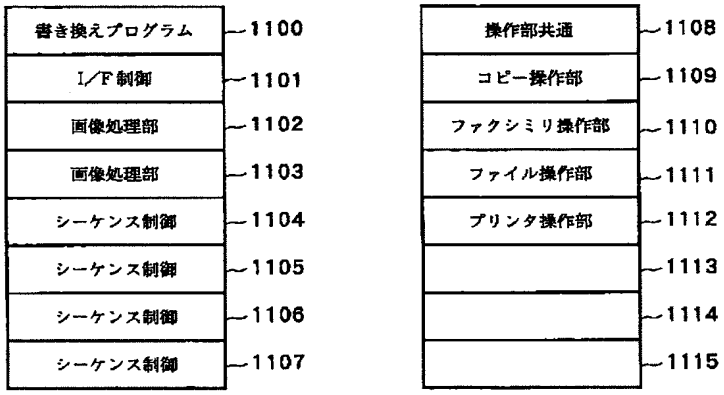
【図９】


51
159
CCD
150
A／D
・
S H
151
画像処理部
プリンタ部52へ
コア部60へ
153
I／F
154
CPU
156
メモリ
157
I／F
155
操作部
リーダ部
外部装置63へ

【図１１】


158
156
CPU
154
RAM
1562
フラッシュROM
1561
159

【図１２】


書き換えプログラム
1100
I/F制御
1101
画像処理部
1102
画像処理部
1103
シーケンス制御
1104
シーケンス制御
1105
シーケンス制御
1106
シーケンス制御
1107
操作部共通
1108
コピー操作部
1109
ファクシミリ操作部
1110
ファイル操作部
1111
プリンタ操作部
1112
1113
1114
1115